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The Impact of Trade Agreements on Intraregional Exports: Evidence from SAARC Countries

Suresh Moktan *

Abstract

This paper investigates the impact of trade agreements among SAARC countries on intraregional exports using a generalized gravity model and panel dataset for the period 1971 to 2005. Empirical tests find scant evidence of the impact of trade agreements on exports for the pre-SAARC and pre-SAPTA periods, but statistically significant and positive impact is observed in the post-SAARC and post-SAPTA periods even amidst sustained significant negative impact of conflict in all sub-periods. This propensity is discernible regardless of the estimation methods applied. However, further tests show that the positive impact emanated not expressly owing to SAPTA per se, but it is rather the effect arising from the delayed impact of the existing trade agreements among the SAARC countries.

Keywords: SAARC; SAPTA; trade agreement; exports; gravity model

JEL Classification: C2; F1

1. Introduction

The issue of free trade and regional integration is becoming synonymous with trade liberalization and a subject of avid interest in the arena of international trade and politics today. It has been essentially taking the form of bilateral trade agreements (BTAs), preferential trading arrangements (PTAs), regional trading arrangements (RTAs) and free trade agreements (FTAs). The South Asian Association for Regional Cooperation (SAARC) was conceived in Dhaka, Bangladesh on December 8, 1985 by the late president Ziaur Rahman of Bangladesh with the broad objectives of economic, social, cultural and scientific cooperation among seven South Asian nations, namely, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

South Asia is home to more than one-fifth of the world's population, and therefore, it is believed to have the potential to become an area of great prosperity based on the idea of growing trade among the member countries. Increased trade, particularly intraregional exports, is expected to be a driving force for economic growth in the region. To this end, the South Asian Preferential Trading Arrangement (SAPTA) was signed in Dhaka on April 11, 1993 to give a boost to regional trade integration, which came into operation in 1995. Four rounds of exchange of trade concessions have taken place under the SAPTA. A large number of products have been offered with concessions exclusively to Least Developed Countries (LDCs). India has offered the largest number of concessions, particularly favoring LDCs with tariff prefer-

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ences ranging from 50-100 per cent (Mukherji, 2004).

Inspired by the worldwide trends and successful experience of India-Sri Lanka bilateral FTA, leaders of SAARC countries have decided to facilitate intraregional trade with the signing of South Asia Free Trade Area (SAFTA) on January 6, 2004, which was ratified on January 1, 2006 and consequently became operational from July 1, 2006. Based on this, the SAARC members have agreed to bring down the average tariffs on goods from 25-30 per cent to 0-5 per cent over the next decade. Separate deadlines have been set for the developing countries, i.e., India, Pakistan and Sri Lanka, and the LDCs, which are Bhutan, Bangladesh, Maldives and Nepal. SAFTA calls for reduction in import duties to 20 per cent by 2008 and between 0-5 per cent by 2013, but allows the LDCs to reduce the tariff rates to 0-5 per cent by the year 2016 (SAFTA, 2005).

Like the European Union (EU), Association of Southeast Asian Nations (ASEAN) and other like-minded trade blocs, SAARC countries share a lot of similarity in culture and socio-economic conditions, but as opposed to the EU or the ASEAN blocs that have deep connections in political, economic and executive areas, members in the SAARC bloc are all in their developing phases and are characteristically far less integrated. Many researchers argue that the volume of intraregional trade continues to be low, despite SAARC's efforts to enhance intraregional trade through bilateral and preferential trading arrangements. In view of the downsides,

Table 1 Status of Trade Agreements among SAARC Countries

Date/Year	Contracting States	Agreement Type/Title
Jan 1972, Renewed Mar 2, 1995	India and Bhutan	Agreement on Trade, Commerce and Transit between the Government of the Republic of India and the Royal Government of Bhutan.
Mar 28, 1972, Renewed Mar 26, 2006	India and Bangladesh	Trade Agreement between India and Bangladesh.
Apr 2, 1976	Nepal and Bangladesh	Trade and Payment Agreement between His Majesty's Government of Nepal and the Government of the People's Republic of Bangladesh.
Apr 3, 1979	Nepal and Sri Lanka	Trade Agreement between His Majesty's Government of Nepal and the Government of the Democratic Socialist Republic of Sri Lanka.
1980, Renewed Sep 2000	Bangladesh and Bhutan	Trade and Transit Agreement between the Government of the People's Republic of Bangladesh and the Royal Government of Bhutan.
Mar 31, 1981	India and Maldives	Trade Agreement between the Government of the Republic of India and the Government of the Republic of Maldives.
Jul 28, 1982	Pakistan and Nepal	Trade Agreement between the Government of Islamic Republic of Pakistan and His Majesty's Government of Nepal.
Dec 6, 1991	Nepal and India	Free Trade Agreement between His Majesty's Government of Nepal and the Government of India.
Apr 11, 1993, Operational Dec 7, 1995	Seven member countries	South Asian Preferential Trading Arrangement (SAPTA).
Dec 28, 1998	India and Sri Lanka	Free Trade Agreement between the Republic of India and the Democratic Socialist Republic of Sri Lanka.
Jun 12, 2005	Pakistan and Sri Lanka	Free Trade Agreement between the Government of Islamic Republic of Pakistan and the Democratic Socialist Republic of Sri Lanka
Jan 6, 2004, Operational Jul 1, 2006	Seven member countries	South Asian Free Trade Area (SAFTA).

Source: Author's compilation from various sources.

SAARC recognizes the need to move towards a more pragmatic approach to regional cooperation. Over the years, the seven South Asian nations have signed several trade agreements (see Table 1). However, none of the earlier studies has attempted to evaluate the actual impact of trade agreements on intra-SAARC trade. Moreover, most of the studies have omitted the effect on small countries, such as Bhutan and Maldives in their analyses. This may be partly due to the scarcity of data and small size of these economies, or perhaps due to lack of researchers' interest because of its negligible influence in the region. Whatsoever the reasons are, there is an apparent need to fill up this vacuum. Hence, examining the feasibility and potential of South Asian trading arrangements is a highly desirable case study.

The objective of this study is, therefore, to investigate whether the trade agreements among seven SAARC countries have actually boosted the volume of intraregional exports. The plain hypothesis is that trade agreements among SAARC members is expected to be positively associated with exports, *ceteris paribus*, as the principal reason for member countries to enter into trade agreements is the prospect of enhancing their exports and furthering trade creation.¹ In light of this, the paper specifically addresses the following key questions:

- What is the actual impact of trade agreements among SAARC countries?
- Have they affected positively or negatively on the growth of exports, and to what extent?
- Did SAPTA play a catalytic role of enhancing the intra-SAARC trade?

One of the contributions of this paper is to answer the above questions and to provide further evidence by estimating a gravity model, which uses a distinctive panel dataset for over a long period spanning 35 years from 1971 to 2005. This period is preferred for three reasons. First, there are very few studies conducted for the SAARC region that seeks to investigate the trade effects over this long period of time. Second, Bangladesh became an independent country in the year 1971.² Third, this long period facilitates the dataset to be divided into sub-periods, enabling to contrast and examine the impacts of trade agreements on exports in different time periods. While addressing the above-mentioned questions, this study also tests the efficacy of free trade agreements in furthering exports, and particularly for the SAARC region, this is the first of its kind. The focus, as such, is to recount the findings after testing the effects of trade agreements before the inception of SAARC and SAPTA, and comparing and contrasting with the post-SAARC and post-SAPTA periods.

The remainder of the paper is organized as follows: Section 2 provides the theoretical foundation and assessment of regional trade integration in South Asia. The empirical methodology and sources of data is presented in Section 3 and Section 4, respectively. The regression results are examined in Sections 5, while Section 6 summarizes the key findings and concludes the paper.

2. Literature Review

Although there are some qualitative studies on SAARC and SAPTA, quantitative studies centering on economic integration in South Asia are limited. Bandara and Yu (2003) point out a number of possible reasons for this. Firstly, many trade analysts have not given much attention since this region did not play a major role in the global trade, investment and growth. Secondly, the data on trade and other variables in this region are scarce. Thirdly, as the volume

¹ Despite theoretical skepticism of RTAs and the like, 'most empirical studies find that trade creation dominates trade diversion' (Rodríguez-Delgado, 2007, p.14).

² Bangladesh declared independence from Pakistan on March 26, 1971 after the Bangladesh Liberation War.

and value of informal trade are very high, published data do not reflect the true picture of trade structure in the region. Finally, while there is much focus on nontariff barriers compared to many other regions in the world, the recognition and quantification of nontariff barriers are difficult. Despite the limitations, available studies may be broadly classified into three different views: pessimistic, optimistic and neutral or cautionary.

From the pessimistic point of view, Hassan et al. (2002) finds that SAARC countries have not only reduced trade among them but also reduced trade with non-members. Singh (2005, p.1) observes the intraregional trade low at about only five percent of the total trade. The author cites the lack of trade complementarities, prevalence of sizeable informal trade, and political tensions as some of the 'culprits'. Chowdhury (2004) examined the issue of convergence of per capita GDP across SAARC countries. The results from his analysis fail to find evidence of convergence. The reasons for non-convergence of per capita GDP is explained by low and falling volume of intra-country trade, weak governance, and low level of growth of individual SAARC countries. Jayaratne (2004) also points out that some issues that have prevented effective regional integration of South Asian nations from more rapid development and benefiting from cross border and global trade and investments are political disputes, macro-economic instability, policy deficiencies, lack of a common position, and low implementation capability among others. Pitigala (2005, p.42) shows that 'South Asian countries can be characterized only moderately as "natural trading partners"', and therefore the trade structures among the South Asian countries may not facilitate a rapid increase in intraregional trade.

In comparison with the rest of the world, the economic size of the SAARC region is small in terms of both GDP and share in the world trade. Recent studies show the economic case, even for SAFTA as pretty weak. For instance, Baysan et al. (2006) argues that it is quite unlikely that trade diversion would be dominant as a result of SAFTA, as it is reinforced by high levels of protection in the form of restrictive sensitive lists and stringent rules of origin. Similarly, Kalegama (2004) asserts that '... not much can be expected from SAFTA. The initial euphoria that comes with the signing of the SAFTA agreement will soon taper away. The realities and the geo-politics of the region will once again determine the pace of negotiations in SAFTA.'³

Conversely, optimists including Bandara and McGillivray (1998) describe signs of progress in liberalizing South Asian trade regimes in the 1990s, even if most of the programmes in South Asian countries, with exception of Sri Lanka, have been slow. They find the recent economic growth in the region quite satisfactory and are likely to continue in the near future. Perhaps, it is for this reason that Bhargava (1998, p.22) suggests South Asians to learn from the European experience. He believes that 'the coming decades will witness meaningful cooperation between the two largest configurations of democratic states in the continents of Europe and Asia in order to build a better world.' The recent move by the EU to become an observer in the SAARC group, indeed, forms the basis towards his line of thinking.

Mohanty (2003) emphasizes that the region has a substantial potential for trade and investment. He rejects the hypothesis that South Asian countries compete among themselves to export similar kind of products to the world market leading to very low level of regional trade. His study finds a significant level of trade potential in the region to promote intraregional trade, and estimates the export potential to be more than six times than the present level of intraregional trade if it is harnessed completely. Mukherji (2004) reckons that bilateral trade among member countries can be self-sustaining when backed by investment linkages. His work demonstrates some modalities by which SAPTA could transform swiftly to SAFTA.

³ See http://www.southasianmedia.net/Magazine/Journal/safta_critique.htm (accessed August 20, 2006).

He stresses that the Trade Liberalization Programme that will be launched under SAFTA must take a more consolidated approach by removing a variety of nontariff barriers, and setting well-defined targets to promote a number of trade facilitation measures. Likewise, CUTS (2005, p.3) notes, 'SAFTA would be a vehicle through which all participants can gain by exploring their competitive advantages. Integration of economies in South Asia would lead to the emergence of a big market for investors.' In the most recent study, Rodriguez-Delgado (2007) estimated the economic impacts of SAFTA using a gravity model covering the data from 1988-2004. Studying the impact of tariff reductions on the GDP, he estimates that SAFTA can provide the highest increase for SAARC countries in terms of trade flows that they could expect from any RTAs.

Dash (1996) argues from more or less neutral perspective that, given the low level of mutual trust, effects of ethnic and religious conflicts, and extent of bilateral disputes in South Asia, it is unrealistic to believe that any substantial growth of regional cooperation is possible without easing political tensions. To evaluate the magnitude of preferential trade under SAPTA, Mukherji (2000) estimated the extent of trade preference under all SAPTA rounds in terms of trade values and percentages of preferential imports. The estimates show that the region's total preferential imports amounted to about US\$479.8 million, nearly half of which went to Pakistan. India's share of preferential trade out of total regional preferential imports was about 26 per cent, while that for Sri Lanka was about 16 per cent. In terms of its total regional imports, he finds that Pakistan had the highest coverage of preferential imports (about 40 per cent), followed by Nepal (35 per cent), India (30 per cent), Bhutan (17 per cent) and Sri Lanka (12 per cent).

Using gravity equation and a panel data for 1996-2002, Hirantha (2004) showed strong evidence of trade creation in the region with no trade diversion effect as far as trade with non-members is concerned. Pattanaik (2006, p.140) has more of a cautionary approach to SAARC's future. He opines that if SAARC continues to remain 'stymied' and the smaller states do not actively integrate, even India's hopes of integrating with other relevant groups will be stifled. The smaller members that seek to gain from the opening of a large and growing Indian economy would also be the losers if SAARC does not prosper. Accordingly, Ghani and Din (2006, p.4) construe that an effective implementation of SAFTA and other regional initiatives 'will require a strong willingness of all members for greater economic integration as well as a favourable political environment in the region.'

Kemal (2004) describes that the trade patterns of the SAARC group vary sharply from country to country. For instance, the share of intraregional imports in total imports in 2000 for Bangladesh, Nepal and Sri Lanka stood at 11.7 per cent, 33.2 per cent and 10.1 per cent respectively. During the same year, Pakistan and India met only 2.3 per cent and 0.7 per cent respectively of their import requirements from the region. Taneja (2006) points out that South Asia is the least integrated region compared to the East Asia, Central Asia, Europe, Latin America, the Middle East and North Africa. Intraregional trade in South Asia is only 0.8 per cent of GDP, one-eighth of the Latin America's level, and only a fraction of East Asia's nearly 27 per cent of GDP. However, India's share in total SAARC trade increased from 38 per cent in 1991 to 45 per cent in 2004. Therefore, Taneja believes that if India and Pakistan could tap the region's trade potential, intra-SAARC trade could undoubtedly reach newer heights. Another topic currently under review is the issue on adopting a common currency in the region. For instance, Saxena (2005) examines if SAARC countries can satisfy the criteria to form an optimal currency area. The author surmises that the benefits of a common currency would materialize from peace between India and Pakistan that economic integration would

bring about.

In sum, we can recapitulate that the future of SAARC countries depends, *inter alia*, not only on the level of economic integration, but it is also largely determined by the political soundness in the region. Without easing political tensions, conflicts, and mistrust among the member nations, it is quite unlikely to hope for any substantive trade integration in the region. Thus, the growth of regional economic cooperation in South Asia calls for committed efforts and strong political will from all leaders to bring about peace, harmony, and social security in the region.

3. Methodology

This paper estimates a generalized gravity model or so-called unilateral exports model, which was applied in earlier works of Mátyás et al. (2000) and Aristotelous (2001), and more recently by Baak (2004) and Billen et al. (2005). With slight modification from a typical gravity model, the generalized gravity model assigns not the product of the exports of two trading countries as in the paper by Dell'Araccia (1999), but the exports from one country to another as the regressand. The advantage of this is that it allows including depreciation of exporting country's currency value as one of the regressors that affects the volume of exports. Moreover, as small countries are expected to export less than big countries, *ceteris paribus*, the dummies for exporting countries can be included (Baak 2004, p.100). As initiated by Rose (2004, p.99), the gravity equation in this paper is further augmented by controlling for a number of 'natural causes of trade' or 'extraneous factors' including in economic, cultural, political and geographical variables that may affect trade.

Regressions are designed in such a way as to capture the effects of trade agreements with respect to both Pre-SAARC and Post-SAARC periods. The sample is broken down into five groups. Table 2 shows the design of regressions conducted in this study. Only five countries are included in the Pre-SAARC I Period (1971-1979) owing to missing data for the period before 1980 for two countries, Bhutan and Maldives. All other periods include seven countries.⁴

Table 2 Regression Design

Regression Group	Period (Year)		Countries Included
	Pre-SAARC Period		
1	Pre-SAARC I	(1971 – 1979)	5 countries: Bangladesh, India, Nepal, Pakistan, Sri Lanka
2	Pre-SAARC II	(1980 – 1984)	7 countries: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
	Post-SAARC Period		
3	SAARC I (or Pre-SAPTA)	(1985 – 1995)	7 countries: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
4	SAARC II (or Post-SAPTA)	(1996 – 2005)	7 countries: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
5	SAARC I+II	(1985 – 2005)	7 countries: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka

⁴ Afghanistan is excluded in this study because it was formally admitted as the eighth member of the SAARC bloc in the 14th Summit held in New Delhi, India on April 3-4, 2007.

3.1 Model Specification

The gravity equation in this paper is different for two reasons. First, the model does not use the total trade flows comprising exports and imports, but exports from one country to another as the regressand. Intuitively, exports of one country are the imports of another country. When both exports and imports are accounted for in trade flows, and if imports are registered much higher than exports, the volume of trade may seemingly be inflated. Moreover, exports in a sense tend to have economic characteristics associated in theory with welfare-enhancing net trade creation effect. Second, this model does not include the exporting country's GDP as one of the regressors to avoid endogeneity problems, as exports form part of the exporting country's GDP (Billen et al., 2006).

Accordingly, the gravity model takes the following form:

$$\begin{aligned} \ln(X_{ijt}) = & \beta_0 + \beta_1 \ln(GDP_{jt}) + \beta_2 \ln(POP_{it}) + \beta_3 \ln(DREX_{ijt}) \\ & + \beta_4 \ln(DIST_{ij}) + \beta_5 BORD_{ij} + \beta_6 LANG_{ij} + \beta_7 CURR_{ijt} \\ & + \beta_8 TRAG_{ijt} + \beta_9 CONF_{ijt} + \beta_{10} MEMB_{ijt} + \beta_{11} LLOCK_{ij} \\ & + \beta_{12} ILAND_{ij} + \beta_{13} PORT_{ij} + \beta_{14} SAPTA_{ijt} + \delta_2 CD_2 + \dots \\ & + \delta_7 CD_7 + \phi TD + \varepsilon_{ijt} \end{aligned} \quad (1)$$

where i, j and t stands for exporting country, importing country and time, respectively; X_{ijt} denotes real exports from i to j at time t ; GDP_{jt} is the real gross domestic product of j at time t ; POP_{it} is the population of i at time t ; $DREX_{ijt}$ is the depreciation rate of the real bilateral exchange rate of i with respect to j at time t ; $DIST_{ij}$ is the great circle distance between i and j ; $BORD_{ij}$ is a dummy variable which is one if i and j share a common border, and zero otherwise; $LANG_{ij}$ is a dummy variable which is one if i and j share a common language, and zero otherwise; $CURR_{ijt}$ is a dummy variable which is one if i and j use common currency at time t , and zero otherwise; $TRAG_{ijt}$ is a dummy variable which is one for having trade agreement between i and j at time t , or zero otherwise; $CONF_{ijt}$ is the index value for conflict between i and j at time t ; $MEMB_{ijt}$ is a dummy variable for membership in other regional trade group(s), which is one if i and j are part of a common free trade area at time t , and zero otherwise; $LLOCK_{ij}$ is a dummy variable equal to one if a country is landlocked, and zero otherwise; $ILAND_{ij}$ is a dummy variable equal to one if a country is an island, and zero otherwise; $PORT_{ij}$ is a dummy variable equal to one if a country has access to sea ports, and zero otherwise; $SAPTA_{ijt}$ is a dummy variable for South Asian Preferential Trading Arrangement, which is one if i and j are part of this agreement at time t , and zero otherwise; CD and TD denote country dummy and time trend dummy respectively; β , δ and ϕ are vectors of nuisance coefficients; and ε_{ijt} is the error term or any other omitted influences.

More specifically, the paper estimates a pooled ordinary least squares (OLS) data model, but for robustness checks it also performs some sensitivity analyses using country and time dummy effects, first differencing, instrument variables (IV), fixed effects and random effects models. The parameters of interest are β_8 , β_9 and β_{14} , i.e., the coefficients for trade agreement ($TRAG$), conflict ($CONF$), and South Asian Preferential Trading Arrangement ($SAPTA$), respectively. Except for dummy variables, all other variables take on log values to narrow the range of variable and to make estimates less sensitive to outlying or extreme observations on the regressand and regressors. The novelty of this paper is that the effect of $TRAG$ is measured vis-à-vis $CONF$ that might likely offset for any frailty of results obtained by using only $TRAG$ as one of the regressors. This variable is selected particularly as a consequence of its strong

influence in determining the magnitude of trade in the SAARC bloc.

3.2 Correction for Endogeneity Bias and Heteroskedasticity

In order to mitigate the potential endogeneity bias resulting from a possible correlation between the $TRAG$ and unobserved characteristics, the paper follows some corrective procedures as inspired by earlier researchers. Baier and Bergstrand (2005) distinguish a standard problem in cross-section empirical work is the potential endogeneity of right-hand side (RHS) variables. If any of the RHS variables in equation (1) is correlated with the gravity equation error term ε_{ijt} , the variable is considered econometrically endogenous and the OLS may yield biased and inconsistent coefficient estimates. They argue that the potential endogeneity bias of RHS variables may arise due to omitted variables, simultaneity, and measurement error. In fact, omitted variables are often the major source of endogeneity bias in gravity equations. Particularly with respect to bilateral trade arrangements, the unobserved heterogeneity in trade flow determinants is associated with the decision of whether or not to form an FTA. For instance, in their earlier work, Baier and Bergstrand (2004, pp.6-8) find strong empirical evidence that pairs of countries that have FTAs are likely to share similar economic characteristics. That is, the probability of two countries' governments seeking to enter into FTA may be high if they expect a large welfare gain from potential bilateral trade creation further deepening liberalization beyond tariff barriers and other non-tariff barriers into 'domestic regulations'. This means that $TRAG_{ijt}$ and the intensity of domestic regulations could be positively correlated, but ε_{ijt} and the intensity of domestic regulations could be negatively correlated. As a result, $TRAG_{ijt}$ and ε_{ijt} can be negatively correlated, and the $TRAG_{ijt}$ coefficient will tend to be underestimated. Therefore, they underscore the importance of addressing the endogeneity. Fortunately, for cross-section data, we can address the problem of omitted variables by including IV; and for panel data, fixed effects and first differencing can be effectively applied to treat endogeneity biases (see Wooldridge, 2003).

Mátyás (1997, 1998), and Harris and Mátyás (1998) also suggest a pooled time-series of cross-sections or panel data in order to identify these biases and correctly specify the econometric model. They advocate the panel data to increase degrees of freedom, to enable identification of business cycle, and correctly account for exporting and importing country effects. Such effects can be treated as constants and estimated by fixed effects model in which one is able to identify separately the unobserved effects of those countries that have strong propensities to export and import, once divergences in other factors such as GDP, population, distance, etc. has already been accounted for. As recommended in Harris and Mátyás' work, this paper also additionally considers a random effects model, where the unobserved effects is assumed to be uncorrelated with the explanatory variables in each time period. All estimations employ heteroskedasticity consistent covariance matrix estimator derived by White (1980), which provides correct estimates of the coefficient covariances in the presence of heteroskedasticity of unknown form. Serial correlation is not an issue because the samples are independent across time.

3.3 Computation of Variables

Following Baak (2004) and Billen et al. (2005), some of the key economic variables in this model have been computed as follows:

3.3.1 Real Exports

The real exports (X_{ijt}) from country i to country j is defined as

$$X_{ijt} = \ln \left(\frac{NX_{ijt}}{USD_t} \times 100 \right) \quad (2)$$

where NX_{ijt} is the annual nominal exports (in US dollars) from country i to country j in year t , and USD_t is the US GDP deflator⁵ in year t .

3.3.2 Real GDP

The real GDP of an importing country j (GDP_{jt}) is defined as

$$GDP_{jt} = \ln \left(\frac{NGDP_{jt}}{USD_t} \times 100 \right) \quad (3)$$

where $NGDP_{jt}$ is the nominal GDP of country j measured by purchasing parity, and USD_t is the US GDP deflator in year t . This variable is a proxy for economic mass or size of the trading country.

3.3.3 Depreciation of real bilateral exchange rate

The depreciation rate of an exporting country's currency value ($DREX_{ijt}$) is determined as

$$DREX_{ijt} = \ln(REX_{ijt}) - \ln(REX_{ijt-1}) \quad (4)$$

where REX_{ijt} is the real exchange rate, which is measured as

$$REX_{ijt} = NEX_{ijt} \times \frac{CPI_{jt}}{CPI_{it}} \quad (5)$$

where NEX_{ijt} is the average nominal exchange rate between country i and country j in year t , and CPI_{it} and CPI_{jt} denote consumer price index of country i and country j respectively in year t . This variable stands as a proxy for prices.

4. Data

The data in this paper come from a wide range of sources. Annual nominal exports data (in million US\$) from the year 1971 to 2005 have been compiled from the IMF's Direction of Trade Statistics (DOTS). Missing exports data have been supplemented from the UN Comtrade, UNC-TAD Handbook of Statistics and National Statistics Bureau of Bhutan. Nominal GDP (in constant 2000 US\$) and population data were obtained from the World Bank's World Development Indicators (WDI). The US GDP deflator, nominal exchange rates, and consumer price indices have been gathered from the IMF's International Finance Statistics (IFS).

The data for distances between two countries were calculated using the Great Circle Distance Between Capital Cities and Time and Date.com. The geographical distance is the theoretical air distance, i.e., the great circle distance. Unless the capital cities of two trading countries are major hubs or trade centers, this paper considers the distance between the major trade centers of two countries. This is because if the great circle distance is measured between the capital cities of two countries, it could probably underestimate or overestimate the actual gravity factor between two trading partners.

The index for conflict variable was taken from Conflictbarometer 2005, Heidelberg Institute for International Conflict Research, Department of Political Science, University of Heidelberg. Other country-specific variables such as border, language, currency, trade agreements, membership in other regional blocs, landlocked and island and status and seaports were obtained from the CIA's The World Factbook, SAARC's official homepage and related websites.

⁵ Eichengreen and Irwin (1996) and Baier and Bergstrand (2005) also scaled the data by GDP deflators to generate real exports and real GDPs.

Additionally, as evoked by Baier and Bergstrand (2005), the paper also introduces some political variables as instruments (z variables hereafter) that might have some correlation in two governments' decision to form an FTA, but may not have correlation with their exports. Past studies such as by Jaggers and Gurr (1999), Mansfield et al. (2002), and Kaufmann et al. (2003) reflect the fact that two countries are more inclined to form FTAs if their governments are more democratic. Therefore, three governance indicators have been selected as z variables from the World Bank's Governance and Anti-Corruption, as F Test suggests that they are jointly significant. These are: (i) Voice and Accountability, (ii) Rule of Law, and (iii) Control of Corruption. The variables are measured in terms of percentile rank (0 to 100) – zero representing as the lowest and 100 as the highest.

5. Empirical Results

5.1 Pooled OLS Estimation (Benchmark)

Table 3 presents the estimation results for pooled OLS data. The following findings emerge from the estimation. The estimated coefficients values are conventional and quite stable across all sub-periods. The coefficients for gross domestic product (GDP), population (POP), depreciation rate of real bilateral exchange rate ($DREX$), distance ($DIST$), border ($BORD$), common currency ($CURR$), trade agreement ($TRAG$), conflict ($CONF$) and membership in ORTG ($MEMB$) are statistically significant and the signs are mostly as expected. While countries with seaports ($PORT$) have positive and significant coefficient, landlocked ($LLOCK$) and island countries ($ILAND$) show negative and/or insignificant impacts on exports in general, which are also as expected. The negative coefficient for $MEMB$ is expected and supports the findings of Pitigala (2005, p.42) since SAARC members are not so much characterized as 'natural trading partners' for most SAARC members demonstrate a tendency to trade outside the region.

In contrast to our expectations, the coefficient for $DIST$ is counterintuitive and statistically significant at 10 per cent level of significance in the sub-period 1. One principal reason for this can be attributed to the fact that the closest neighbors, namely, India, Pakistan and Bangladesh were hostile to each other during the period on account of the 1971 Bangladesh Liberation War (*Mukti Juddho*) or what is commonly known as the Indo-Pakistan War of 1971. Hence, trade plummeted sharply for these countries during the period. The only two countries that were engaged in formal trade were Nepal and Sri Lanka, which are the most distant countries in the region. Therefore, in this case, the result cannot be interpreted in a causal fashion.

The coefficients for $LLOCK$ and $PORT$ are also more or less consistent to expectations. However, the negative coefficient for $PORT$ in the sub-period 2 could appear as result of repercussions of the war among three major countries in the earlier sub-period 1, as noted above.

One result that attracts attention is the negative and statistically significant coefficient for language ($LANG$) for the sub-period 2 through 5, while our conventional wisdom tells us that it should have a positive coefficient. The reason goes back to none other than the above-mentioned interpretation, wherein most of the trading partners in the region with similar languages have been exhibiting animosity against each other due to history of war and contentions, thereby resulting in less trade and nullifying the expected positive impact.

Another parameter of interest is the coefficient for $CONF$, which is negatively associated with exports at 1 per cent significance level against a two-sided alternative across all periods.

Table 3 Gravity Equation Estimates for Pooled OLS Data Model (Benchmark)

Specification	Sub-period 1	Sub-period 2	Sub-period 3	Sub-period 4	Sub-period 5
	Pre-SAARC I	Pre-SAARC II	SAARC I or Pre-SAPTA	SAARC II or Post-SAPTA	SAARC I+II
Regressors	(1971-1979)	(1980-1984)	(1985-1995)	(1996-2005)	(1985-2005)
$\ln(GDP_{jt})$	2.51*** (4.68)	1.84*** (11.86)	1.83*** (25.10)	2.23*** (24.48)	1.74*** (29.28)
$\ln(POP_{jt})$	2.91*** (4.57)	2.37*** (8.84)	1.77*** (15.53)	1.542*** (11.99)	1.43*** (15.06)
$\ln(DREX_{ijt})$	1.99*** (3.04)	0.65 (1.00)	0.45 (0.21)	1.19*** (2.30)	1.47*** (3.50)
$\ln(DIST_{ij})$	1.59* (1.85)	-2.63*** (-2.73)	-3.65*** (-9.21)	-4.52*** (-10.89)	-3.42*** (-11.07)
$BORD_{ij}$	0.77 (1.37)	0.61 (1.52)	0.28* (1.71)	0.37*** (2.11)	0.41*** (3.15)
$LANG_{ij}$	1.65 (1.57)	-2.17* (-1.72)	-2.13 (-1.57)	-1.45 (-1.24)	-1.55* (-1.85)
$CURR_{ijt}$		2.99*** (4.40)	2.40*** (6.89)	2.14*** (8.99)	2.02*** (8.61)
$TRAG_{ijt}$	-0.39*** (-3.31)	-0.99*** (-2.01)	0.14 (0.73)	0.57*** (3.86)	0.59*** (5.11)
$CONF_{ijt}$	-0.86*** (-4.02)	-0.61*** (-6.09)	-0.75** (-2.10)	-0.61** (-1.99)	-0.67** (-2.45)
$MEMB_{ijt}$	0.03 (0.04)	-0.88*** (-2.05)	-1.19*** (-7.05)	-0.81*** (-3.98)	-0.84*** (-5.71)
$LLOCK_{ij}$	0.62 (0.72)	-3.01*** (-3.72)	-0.30 (-0.86)	-1.06*** (-2.64)	-0.38 (-1.29)
$ILAND_{ij}$	0.46 (0.57)	0.71 (1.05)	0.04 (0.14)	0.14 (0.50)	-0.05 (-0.20)
$PORT_{ij}$		-1.88*** (-3.76)	3.10*** (14.49)	2.02*** (8.59)	2.61*** (14.56)
Constant	-59.19*** (-4.80)	-24.27*** (-5.56)	-20.55*** (-14.31)	-20.57*** (-12.90)	-18.59*** (-14.91)
Observations	180	210	462	420	882
R^2	0.50	0.67	0.81	0.80	0.77

Note: Numbers in parenthesis are t-statistics. The regressand is the natural log of exports $[\ln(X_{ijt})]$. *, ** and *** indicate statistical significance at 10 per cent, 5 per cent and 1 per cent, respectively.

In sub-period 1, the coefficient for *CONF* is -0.86, suggesting that the presence of conflict between two trading partners decreases exports by about 58 per cent ($e^{-0.86}$). Similarly, in sub-period 2, sub-period 3, sub-period 4 and sub-period 5, the negative impact of *CONF* is reflected by the decrease in exports between the trading partners by about 46 per cent, 53 per cent, 46 per cent and 49 per cent, respectively. Given the scenario of hostility and incessant discord among SAARC members as already discussed above, this result is not surprising.

Of special interest in this regression result is the coefficient for *TRAG*, which is negative and statistically significant at 1 per cent level of significance for the sub-period 1 and sub-period 2, insignificant in the sub-period 3, and then positive and highly significant again in the sub-period 4 and sub-period 5. It is quite evident that before SAARC came into existence, intraregional trade was much lower among the South Asian nations. Even after the inception of SAARC in 1985, the impact is not significant during the sub-period 3. However, the impact of *TRAG* can be clearly observed in the sub-period 4 and sub-period 5, i.e., after the SAPTA came into operation in 1995. For instance, in the case of sub-period 2, which is the period just before SAARC came into force, the coefficient of *TRAG* is -0.99, and the coefficient in sub-period 4, i.e., the period after SAPTA came into operation is 0.57. This implies

that even those countries that did have trade agreements had about 63 per cent ($e^{-0.99}$) less exports in the sub-period 2. However, in the sub-period 4, exports increased by about 77 per cent ($e^{0.57}$). There is a further increase in exports in the sub-period 5 by about 80 per cent ($e^{0.58}$). These results indicate that the impact of trade agreements is time-dependent, which is largely consistent with the findings by Baier and Bergstrand (2005). Moreover, this strongly supports our hypothesis and the case for deeper regional trade integration in South Asia.

5.2 Robustness Checks

Thus far, we have observed strong positive impact of trade agreements on exports, but are the findings robust? To check the robustness of the benchmark results, some sensitivity analyses are performed using country and time dummies, first differencing, IV technique, and fixed as well as random effects models. For brevity, all tables of results are not shown.

5.2.1 Country Dummy Effects

With the introduction of country dummies, both *GDP* and *POP* are still strongly associated with exports. The impact of *DREX* is found to be largely insignificant. This may be because almost all SAARC countries follow a fixed exchange rate system and so the depreciation rates among these countries are negligible. Following similar trend in Table 3, the coefficient for *DIST* is found to be positive in the sub-period 1, but negative and significant for the most part, which is typically expected. The coefficient for *BORD* turns out to be insignificant and even negative in the sub-period 1 with the inclusion of country dummies. The estranged relationship between India and Pakistan two major countries in the region could yet again explain this phenomenon. Besides, although Bangladesh, Bhutan, and Nepal also share a common border, the gravity effect of these smaller countries have so little impact relative to huge economies of India and Pakistan.

The coefficients for *LANG*, *CURR*, *TRAG* and *CONF* show very similar pattern as in the benchmark results. The interpretations for this are not different from what has been deliberated earlier. Nevertheless, a careful scrutiny demonstrates that the positive impact of *TRAG* has slightly weakened in the sub-period 4 and sub-period 5. On the other hand, *CONF* has a further negative impact on exports, as the exports during the sub-period 4 and sub-period 5 decreased by almost 59 per cent ($e^{-0.90}$) and 51 per cent ($e^{-0.72}$), respectively. Except for the sub-period 2, *PORT* has a significant impact on exports in the sub-period 3, sub-period 4 and sub-period 5.

Interestingly, economically larger countries, particularly India, Pakistan and Bangladesh did not fare well in sub-period 1, displaying clearly the backlash of the war during the period. Nevertheless, beginning from the sub-period 3, i.e., soon after SAARC came into being, trade volume of these three countries picked up momentum with positive and significant impacts on the regressand. As characteristic to gravity effects, small economies like Bhutan, Maldives and Nepal are losers in the game, but it is interesting to note that during the sub-period 1 when all major players were at conflict, only Nepal and Sri Lanka fared well as they continued to have good terms of trade. During the period, *DIST* though positive, is not statistically different from zero, which further justifies this observation.

5.2.2 Time Dummy Effects

Adding time dummies has little material effect on the estimated results. However, a few points worth mentioning are the insignificant impacts of *DREX* and *BORD*; and the inclusion of lag for *TRAG* has a stronger positive impact especially in the sub-period 5. Inclusion of one lag for *TRAG* has an increased impact on coefficient from 0.47 to 0.49. With two lags, the coefficient value leaped to 0.50.⁶ In regards to coefficients of the *CONF* variable, the trend is

very similar with significantly negative impacts on exports for all sub-periods.

5.2.3 Country and Time Dummy Effects

There is not much variation in the results even after controlling for both country and time dummy effects. In general, we observe that the *TRAG* and *CONF* effects retain similar trend. However, the intensity of *TRAG* weakens in comparison to the earlier results.

5.2.4 First Differencing

First differencing is particularly useful when the unobserved factors that change over time are serially correlated. If ε_{ijt} follows a random walk, meaning that there is very substantial positive serial correlation, then the difference $\Delta \varepsilon_{ijt}$ is serially uncorrelated, and therefore, first differencing is a good alternative to solve this problem.⁷

Focusing again on the *TRAG* and *CONF* variables, the coefficients retain the expected signs as before. *TRAG* has a highly significant positive impact on exports in the post-SAARC periods, i.e., in the sub-period 4 and sub-period 5. The estimates suggest that *TRAG* increases partner countries' exports by about 127 per cent ($e^{0.82}$) in the sub-period 4 and about 132 per cent ($e^{0.84}$) in the sub-period 5. *CONF*, on the other hand, has a negative impact in all periods, and the coefficients are statistically significant from the sub-period 3 through sub-period 6, but the impacts are lesser as compared to the earlier OLS estimates.

5.2.5 IV and 2SLS Estimation

A set of three z variables has been used as IV that is likely to influence the formation of FTA and less likely to be correlated to the error term, ε_{ijt} . The method of IV can be used to solve the problem of endogeneity of one or more explanatory variables. This method applies two staged least squares (2SLS or TSLS), which is second in popularity next to OLS for estimating linear equations in applied econometrics.

Six different scenarios were tested using IV technique (see Table 4). The results obtained by using z variables do not deviate much from the earlier results. The impact of *TRAG* is still positive and statistically significant, while the impact of *CONF* is negative and statistically significant. Nevertheless, in specifications 5 and 6, with the first differencing *TRAG* has a significant impact on exports yielding an increase in exports by about 125 per cent ($e^{0.81}$) each, respectively. Hausman Test is applied to compare the OLS and 2SLS estimates and to determine whether the differences are statistically significant. This procedure tests the null hypothesis (H_0) that the error term ε_{ijt} of the OLS and the error term of the 2SLS (say, v_2) are not correlated. The test fails to reject the H_0 concluding the exogeneity of z variables because ε_{ijt} and v_2 are not correlated. In addition, the testing of overidentifying restrictions used in the 2SLS suggests that the model is just identified. Thus, the impact of *TRAG* in the last two specifications is consistent and reliable. Similar results from the first differencing method further justify the robustness of the estimates.

5.2.6 Fixed and Random Effects Models

F Test was conducted to test whether or not the fixed effects coefficients are equal or not by comparing the sum of squared residuals (SSR) from the fixed effects model and the random effects model. The computed p -value of zero soundly rejects the H_0 of equal intercepts. In addition, p -values of the Hausman Test are essentially zero for almost all periods, and so the H_0 of the random effects model in favor of the fixed effects model is rejected.

As in the pooled OLS model, one can also observe that almost all the coefficients of *GDP* and *POP*N for both the fixed effects model and random effects model are statistically

⁶ See Section 5.4 for more discussion on lagged effects of *TRAG*.

⁷ First differencing of the panel data yields some potential advantages over fixed effects. See Wooldridge (2003, pp.467-468) for further details.

Table 4 Gravity Equation Estimates using IV

Specification	(1)	(2)	(3)	(4)	(5)	(6)
Regressors	With no Country and Time Dummies	With Country Dummies	With Time Dummies	With Country and Time Dummies	With First Differencing and Time Dummies	With First Differencing and no Time Dummies
$\ln(GDP_{jt})$	2.23*** (24.48)	2.37*** (23.55)	2.28*** (23.62)	2.37*** (23.49)	1.90*** (6.17)	1.89*** (6.10)
$\ln(POP_{it})$	1.54*** (11.99)	-8.77*** (-3.55)	1.64*** (11.73)	-10.25*** (-2.04)	-0.32 (-0.47)	-0.34 (-0.51)
$\ln(DREX_{ijt})$	7.19*** (2.30)	-0.07 (-0.017)	-1.64 (-0.41)	0.27 (0.06)	5.78*** (2.46)	6.10*** (2.64)
$\ln(DIST_{ij})$	-4.52*** (-10.89)	-4.79*** (-11.67)	-4.59*** (-11.20)	-4.79*** (-11.65)	-4.70*** (-2.95)	-4.67*** (-2.93)
$BORD_{ij}$	0.37*** (2.11)	-0.07 (-0.21)	0.24 (0.81)	-0.06 (-0.20)	1.55*** (2.21)	1.56*** (2.23)
$LANG_{ij}$	-1.45*** (-5.24)	-1.33*** (-5.25)	-1.44*** (-5.65)	-1.33*** (-5.25)	-1.61*** (-2.46)	-1.59*** (-2.44)
$CURR_{ijt}$	2.14*** (8.99)	2.23*** (5.04)	2.26*** (5.21)	2.22*** (5.03)	0.51 (0.54)	0.51 (0.54)
$TRAG_{ijt}$	0.57*** (3.86)	0.34* (1.78)	0.50*** (2.73)	0.34* (1.79)	0.81* (1.80)	0.81* (1.76)
$CONF_{ijt}$	-0.81*** (-10.66)	-0.90*** (-8.24)	-0.83*** (-7.67)	-0.90*** (-8.23)	-0.69*** (-3.08)	-0.68*** (-3.06)
$MEMB_{ijt}$	-0.811*** (-3.98)	-1.32*** (-4.92)	-0.82*** (-3.86)	-1.37*** (-4.45)	1.78 (1.34)	1.81 (1.37)
$LLOCK_{ij}$	-1.06*** (-2.64)	-8.99*** (-4.52)	-0.94 (-1.64)	-10.10*** (-2.63)	-3.43*** (-3.23)	-3.409*** (-3.16)
$ILAND_{ij}$	0.14 (0.50)	-27.46*** (-4.11)	0.27 (0.85)	-31.40*** (-2.33)	-4.04*** (-2.53)	-4.06*** (-2.53)
$PORT_{ij}$	2.02*** (8.59)	1.84*** (3.57)	2.06*** (4.16)	1.84*** (3.56)	1.86 (1.46)	1.88 (1.46)
Constant	-20.57*** (-12.90)	63.22*** (3.13)	19.08*** (3.40)	36.39 (0.44)	-23.89 (-0.63)	0.01 (0.22)
Observations	420	420	420	420	420	420
2SLS R^2	0.80	0.81	0.81	0.81	0.54	0.54

Note: Numbers in parenthesis are t-statistics. The regressand is the natural log of exports $[\ln(X_{ijt})]$. *, ** and *** indicate statistical significance at 10 per cent, 5 per cent and 1 per cent, respectively. Instrument variables used are (i) Voice and Accountability, (ii) Rule of Law, and (iii) Control of Corruption.

significant and positive, while the coefficient for the *DIST* is statistically significant with a conventional negative coefficient. The coefficient for *DREX* is largely insignificant in the case of both fixed and random effects.

5.3 Effect of *SAPTA*

Researchers, more often than not, have raised debates that *SAPTA* has not been the main vehicle for enhancing intra-SAARC trade. This contentious argument necessitates further empirical testing. As we have seen in the earlier tests that the impact of *TRAG* is mostly seen in the sub-period 4 and sub-period 5, i.e., the period after *SAPTA* came into operation. This gives a high possibility for us to conclude that the major impact on exports could have arisen because of the *SAPTA*, and at the same time, undermine the role of *TRAG* as such. In order to unravel this paradox, three more tests were carried out using *SAPTA* as one of the dummy regressors (see Table 5).

Interestingly, *SAPTA* does not show significant impact at conventional significance levels

Table 5 Effects of *SAPTA* and *TRAG*

Impact of <i>SAPTA</i>			Impact of <i>TRAG</i>		
Countries with Trade Agreements	Countries without Trade Agreements	Countries with and without Agreements	Countries with Trade Agreements	Countries without Trade Agreements	Countries with and without Agreements
(1985-2005)	(1985-2005)	(1985-2005)	(1985-2005)	(1985-2005)	(1985-2005)
Not significant, positive coefficient.	Significant at 1% significance level, $e^{-0.84} = -56.83\%$.	Not Significant, negative coefficient.			Significant at 1% significance level, $e^{0.56} = 75.07\%$.
(1980-2005)	(1980-2005)	(1980-2005)	(1980-2005)	(1980-2005)	(1980-2005)
Not significant, positive coefficient.	Significant at 1% significance level, $e^{-0.79} = -54.62\%$.	Not Significant, but negative coefficient.			Significant at 1% significance level, $e^{0.41} = 50.68\%$.
(1971-2005)	(1971-2005)	(1971-2005)	(1971-2005)	(1971-2005)	(1971-2005)
Significant at 1% significance level, $e^{-0.35} = -29.53\%$.	Significant at 1% significance level, $e^{-0.95} = -61.33\%$.	Significant at 1% significance level, $e^{-0.25} = -22.12\%$.			Significant at 1% significance level, $e^{-0.56} = -42.88\%$.

Source: Author's estimation.

even in the post-SAARC periods, and as we move backwards in time, *SAPTA* is rather negatively associated with exports especially for those countries that do not have bilateral trade agreements. On the other hand, it is fascinating to observe that *TRAG* has a significant impact during the later two periods from 1985-2005 and from 1980-2005. Although the impact of *TRAG* also diminishes as we move backwards towards the earlier period, the impact is not statistically significant. This could simply mean that the impact of *TRAG* increased over time during the later sub-periods not particularly because of the inception of the *SAPTA*. Stated otherwise, *SAPTA* has not been the main vehicle for increasing the impact of *TRAG* on exports in the later periods. Therefore, the increased intraregional exports in the post-SAARC periods could have apparently stemmed from the delayed impact of the existing bilateral trade agreements among SAARC countries (as discussed further in the subsequent section).

5.4 Lagged Effects of *TRAG*

Table 6 shows the comparative lagged effects of *TRAG*. Adjusting for unobserved heterogeneity using country and time dummy effects provide impressive results. For instance, in specification (1), the impact of *TRAG* after 15 years (i.e., in 2000) from the inception of SAARC in 1985 is about 37 per cent increase, an increase by 1.37 times. During the same year, the impact of *TRAG* is nearly 58 per cent, 52 per cent and 59 per cent in specification (2), (3) and (4), respectively. However, in 2004 (after 19 years), there is a dramatic increase in the *TRAG* effects from about 82 per cent in specification (1) to almost 119 per cent in specification (2), 121 per cent in specification (3) and 128 per cent in specification (4). That is, the impact of *TRAG* is more than *twofold* using country and time dummy effects. These results are evocative and consistent with the findings of Baier and Bergstrand (2005), whose estimates suggest that an FTA on average *doubles* two member countries' bilateral trade after 10 years.⁸

⁸ Using panel data, Rose (2004) estimated an FTA impact using fixed effects and found $e^{0.94}$ or 156 per cent, while Tomz (2004) estimated the FTA impact of $e^{0.76}$ or 114 per cent.

Table 6 Comparative Lagged Effects of *TRAG*

Specification	(1)		(2)		(3)		(4)	
	With no Country and Time Dummies (1985-2005)		With Country Dummies (1985-2005)		With Time Dummies (1985-2005)		With Country and Time Dummies (1985-2005)	
Year	Per cent Increase	No. of Times Increase	Per cent Increase	No. of Times Increase	Per cent Increase	No. of Times Increase	Per cent Increase	No. of Times Increase
1986	4.73	1.05	6.19	1.06	6.79	1.07	6.21	1.80
1987	6.07	1.06	9.46	1.09	10.00	1.10	9.51	1.10
1990	15.75	1.16	22.86	1.23	27.27	1.27	23.68	1.24
1995	40.99	1.41	55.39	1.55	65.54	1.66	57.10	1.57
2000	36.67	1.37	57.66	1.58	52.45	1.52	58.59	1.59
2004	81.85	1.82	118.72	2.19	121.37	2.21	127.84	2.28

Note: The base year is 1985.

Source: Author's estimation.

Note that the overall percentage increase of exports after 19 years from the base year 1985 to 2004 is 885 per cent (see Table 7). If we consider the cumulative average impact of *TRAG* during this time period in specifications (1), (2), (3) and (4) in 2004 as 113 per cent, then the independent role of the *TRAG* among different variables in enhancing intraregional exports works out to be approximately 13 per cent. Understandably, it took nearly two decades for *TRAG* to show reasonably clear impacts, which characterize the sluggish nature of SAARC's progress in trade integration.

Table 7 Intra-SAARC Exports (1985-2004)

Year	US\$ Million	Elapsed no. of Years	Percent Increase
1985	600.83	0	0.0
1986	553.61	1	-7.86
1987	614.76	2	2.32
1988	786.67	3	30.93
1989	862.25	4	43.51
1990	862.96	5	43.63
1991	1013.15	6	68.63
1992	1238.75	7	106.17
1993	1191.47	8	98.31
1994	1433.54	9	138.59
1995	2023.65	10	236.81
1996	2144.45	11	256.92
1997	2173.94	12	261.82
1998	2466.26	13	310.48
1999	2180.00	14	262.83
2000	2593.37	15	331.63
2001	2826.68	16	370.47
2002	2997.97	17	398.97
2003	4773.32	18	694.46
2004	5919.36	19	885.20

Note: The percentage increase is measured from the base year 1985.

Source: Author's calculation using data from the UNCTAD Handbook of Statistics 2005.

6. Summary and Conclusions

This paper estimated a generalized form of gravity model to determine the impact of trade agreements on exports in the SAARC region. The model performed well empirically yielding reasonably precise and good estimates, which are largely consistent with results of the earlier studies employing a gravity model and pooled trade data.

The fundamental question that arose from the results was whether trade agreements have had a significant positive impact on the volume of intraregional exports of SAARC countries. The answer is *yes*, but one should interpret with caution. This is because the empirical tests have found no evidence of the impact of trade agreements on exports in pre-SAARC I (sub-period 1 from 1971 to 1979), pre-SAARC II (sub-period 2 from 1980 to 1984), and SAARC I (sub-period 3 from 1985 to 1995). However, a significant positive impact of trade agreements on exports is observed in SAARC II or post-SAPTA period (sub-period 4 from 1996 to 2005) and for SAARC I+II (sub-period 5 from 1985 to 2005), even amidst sustained significant negative impact of conflict in all sub-periods. The phenomenon is observable irrespective of which estimation methods are applied. Thus, the results soundly support the hypothesis indicating positive benefits of having trade agreements among SAARC countries.

The next important question was to ascertain whether the signing of the SAPTA has stimulated intra-SAARC trade in the region. Empirical tests find very little evidence of the impact of SAPTA, signalling the failure of catalytic role played by SAPTA in inducing significant trade creation within the region. Furthermore, tests show that the actual impact appears to have emanated not specifically from the signing of SAPTA *per se*, but it is rather the effect arising out of the delayed impact of the existing trade agreements.

This study definitely supports the case for FTAs and further trade integration among SAARC member nations, clearly signaled by the positive impact of trade agreements seen in the post-SAARC periods. With the growing interest of observers around the world, SAARC will certainly find new opportunities, but one can only become more optimistic as SAPTA and SAFTA matures through further dismantling of both tariff and nontariff barriers. The weakness of SAPTA can be compensated by shaping and reinforcing the influence of SAFTA. Although there are undoubtedly good prospects to boost up future exports, this would however, entail concerted efforts of the member nations to mitigate conflicts, evolve new comparative advantages and complementarities, aggregate with other regional blocs, and eliminate the existing impediments to intraregional trade with right perspective and affirmative political will. In addition, SAARC should take a more holistic and forward-looking approach by including deeper forms of integration in other trade facilitation measures such as services, energy, institutional and infrastructure development, monetary and investment cooperation.

Notwithstanding, the model was kept simple using widely accepted techniques and conventional empirical methodology. Future work could aim to customize models with more contemporary techniques. It might also be interesting to consider addressing the welfare implications of trade integration, and exploring the relevance and potential for pan-Asian-European economic cooperation. Another area would be to investigate the effects of emerging scenario in SAARC's future membership and new perspectives. Finally, while the focus of this paper was mainly to see the impact of trade agreements on exports, other fitting macroeconomic variables may well be considered. This is only a beginning for further probing.

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