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**Fulfilling the Promises of South
Asian Integration:
A Gravity Estimation**

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Abstract

In all the regions of the contemporary world—including Asia—there is a growing trend in market consolidation through regional collaboration in the form of bilateral and regional trade agreements. Regional cooperation and integration can facilitate the way for expanding markets and creating trade opportunities. However, market-led integration in South Asia lags behind other regions, even though the region's geography and comparative advantages offer the potential for a highly integrated trade, investment, and production space. The South Asian Association for Regional Cooperation (SAARC), which is the most important umbrella organization in the region, has taken several initiatives for enhancing integration—the South Asian Preferential Trading Arrangement (SAPTA), and the South Asian Free Trade Area (SAFTA), and more recently the SAARC Agreement on Trade in Services (SATIS), which was signed in 2010 (SAARC Secretariat 2004, 2010). It is early days, but there is statistical evidence suggesting that intra-regional trade among the SAFTA members is rising slowly but surely. Policymakers as well as business communities across the South Asian region have become increasingly interested in SAFTA and its potential benefits.

The purpose of this paper is to examine the determinants and trade effects of SAFTA using empirical methods. It begins with an overview of South Asia for a general understanding of the state of the region's economy and trade as well as the recent progress in global and regional integration of the South Asian economies. The paper then proceeds to review some of the relevant studies on South Asia's trade integration within the context of the empirical methods used in analyzing trade effects of regional instruments. An empirical specification of the gravity model is developed in the next section to analyze the determinants of trade flows for the SAFTA countries. Based on the results of the modeling exercise, the concluding section of the paper discusses the policy implications of SAFTA, highlighting the need for maintaining the primacy of economic integration in the region's growth and development processes. The paper argues that the recent success in the growth performance of the South Asian countries offers prospects as well as challenges for deeper integration with the global economy. Integration under the SAFTA is, South Asia must understand, the first step in that direction.

Contents

1. INTRODUCTION

Many Asian countries have experienced sustained economic growth since the early 1980s; this has resulted in an increase of Asian countries' share in global gross domestic product (GDP) and a significant rise in their per capita income. The region hosts some of the most dynamic economies of the contemporary world. The economic strength of India and the People's Republic of China (PRC) is already visible while the potential of other economies is also recognized.[1] Although many risks and challenges still persist, the Asian region now enjoys a strong economic position, and is expected to have a more important and defining role in the global economy.

Increased participation in international trade has been a decisive factor in the growth of the emerging Asian economies. The import substitution policies that many Asian countries pursued during the post-Second World War period did not prove to be effective, but these policies were in place for a long time and it took decades to initiate the first reforms. During the 1970s, East Asia[2] started opening up, embracing outward-oriented strategies which resulted in bringing dynamism to their economies. The region followed an export-led growth model with most final goods sold in the markets of Europe and the United States. In East Asia, it was the market that drove the economy toward improved efficiency and enhanced productivity. Despite these important lessons, growth-retarding import substitution policies persisted much longer in South Asia.[3] The situation was further aggravated by political conflicts, which has been a major feature of the state formation process in South Asia. Not surprisingly, South Asia as a whole has typically been characterized by low trade-to-GDP ratio, sluggish growth and industrialization, and weak export performance. Policy changes started to occur in the early 1990s when individual South Asian economies began to embrace growth-accelerating policy reforms with the gradual opening up of their economies. Like East Asia, South Asia also adopted a growth model based on trade linkages with Western markets. Access to large markets allowed these countries to exploit their economies of scale, while trade liberalization stimulated the growth of their productive sectors.

Elsewhere in the world—particularly in East Asia—there is a growing trend in market consolidation through regional trading arrangements in the form of bilateral and regional trade agreements. Regional cooperation and integration, like globalization, can facilitate the way for expanding markets and creating trade opportunities (ADB and AusAID 2009). In the East Asian export-oriented industries, market-led *de facto* regionalization preceded formal *de jure* integration. The South Asian economies, on the contrary, have not been able to gear up their market integration either formally or informally, and the region has remained the least integrated one, although its geography and comparative advantages hold out the potential for a highly integrated trade, investment, and production space (Tewari 2008). The South Asian Association for Regional Cooperation (SAARC), which is the most important umbrella organization in the region, has taken several initiatives for enhancing integration—the South Asian Preferential Trading Arrangement (SAPTA) and the South Asian Free Trade Area (SAFTA), and more recently the SAARC Agreement on Trade in Services (SATIS)

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[1] Most of the Goldman Sachs-identified Next Eleven countries with potential to become leading economies of the world (along with Brazil, Russia, India, and the PRC) are from the Asian region (Goldman Sachs 2007).

[2] East Asia in this paper refers to the ten member countries of the Association of Southeast Asian Nations (ASEAN)—Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam; plus the PRC, the Republic of Korea, and Japan.

[3] In this paper, South Asia refers to the eight member countries of the South Asia Association for Regional Cooperation (SAARC)—Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka, and the Maldives. However, due to the unavailability of data, Afghanistan and Bhutan have not been included in most of the analytical parts of this study.

which was signed in 2010 (SAARC Secretariat 2004, 2010). Not much has been achieved so far under these instruments, but there is statistical evidence suggesting that intra-regional trade among the SAFTA members is rising slowly but steadily: the ratio increased from 2.91% in 1990 to 4.31% in 2010 (ADB 2012b). Policymakers as well as business communities across the South Asian region have become increasingly interested in SAFTA and its potential benefits.

The purpose of this paper is to examine the determinants and trade effects of SAFTA. Section two of the paper provides a general overview of South Asia's economy and trade. Section three and four discuss the empirical methods used in analyzing trade effects and reviews some relevant studies on South Asia's trade integration. Section five develops an empirical specification of the gravity model to analyze the determinants of trade flows for the SAFTA countries. Section six concludes the paper with a discussion on the policy implications of SAFTA based on the results of the empirical study.

2. OVERVIEW OF SOUTH ASIA'S ECONOMY AND TRADE

Despite their economic dynamism since the early 1990s, the South Asian countries still face a plethora of risks or challenges in terms of reducing poverty, sustaining future growth, and minimizing economic and non-economic inequalities. As of 2011, the region accounts for about 24% of global population but only 3.25% of total world GDP (World Bank 2012a). According to the World Bank's most recent poverty estimates, about 571 million people (nearly one-third of the total) in the region survive on less than $1.25 a day (World Bank 2012b). South Asia's participation in international trade has been significantly limited; in 2010, its total trade with the world was $951 billion (ADB 2012a), and its share of total world exports accounted for a mere 2.3% (World Bank 2012a). Much of the region's potential is yet to be tapped.

In terms of economic size, the eight members vary significantly. India holds more than 80% of total South Asian GDP, whereas smaller economies such as Afghanistan, Bhutan, the Maldives, and Nepal account for less than 1% each (Figure 1).

Figure 1: Share of Individual Countries' GDP in South Asia's Total GDP 2011
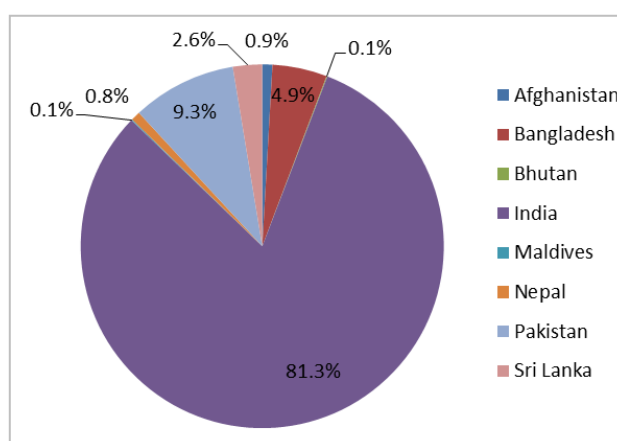
Source: Author's calculations based on World Bank 2012a (World Development Indicators 2012.
Available: *http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2012*, accessed 16 August 2012).

South Asia's economic structure has typically been characterized by low aggregate income, weak human resources, and a rather low level of economic diversification. Not surprisingly, the regional economy has traditionally been heavily dependent on agriculture. While South Asia is reducing its overdependence on agriculture, this sector still retains a significant share in the region's economy (Figure 2), and accounted for more than 50% of total employment in

2010 (World Bank 2012a). In the services sector, the region's success has been remarkable. In 1970, the services sector accounted for about 38% of the region's total GDP, but by 1980 it had overtaken agriculture to become the largest sector, accounting for over 40% of total GDP. By 2011, this ratio had increased to 56% (Figure 2). It is also the fastest growing region of the world in terms of exports of services. From 1995 to 2010, commercial services exports from South Asia increased nearly 13 times (World Bank 2012a). With India leading the way, Bangladesh, Pakistan and Sri Lanka also experienced rapid growth of services exports. The manufacturing sector, which did not make good progress in terms of its share of GDP, has been predominated by the textiles and clothing industry. Of late, this sector has started to diversify so as to incorporate higher value-added commodities. On the other hand, unlike in East Asia, developments in industry (including manufacturing) have been slower, and since 1980 the sector has accounted for around a quarter of total GDP. Inward-oriented policies, coupled with a rigid labor market and industrial regulations retarded the growth of this sector (Ahluwalia 2002). With industry and agriculture performing below par, South Asia's services sector, led by India, is likely to become "the harbinger of a new South Asian services-led growth paradigm" (Nabi et al. 2010: vi).

Figure 2: Shares of Agricultural, Manufacturing, and Services Sectors in the South Asian Economy (% of GDP)
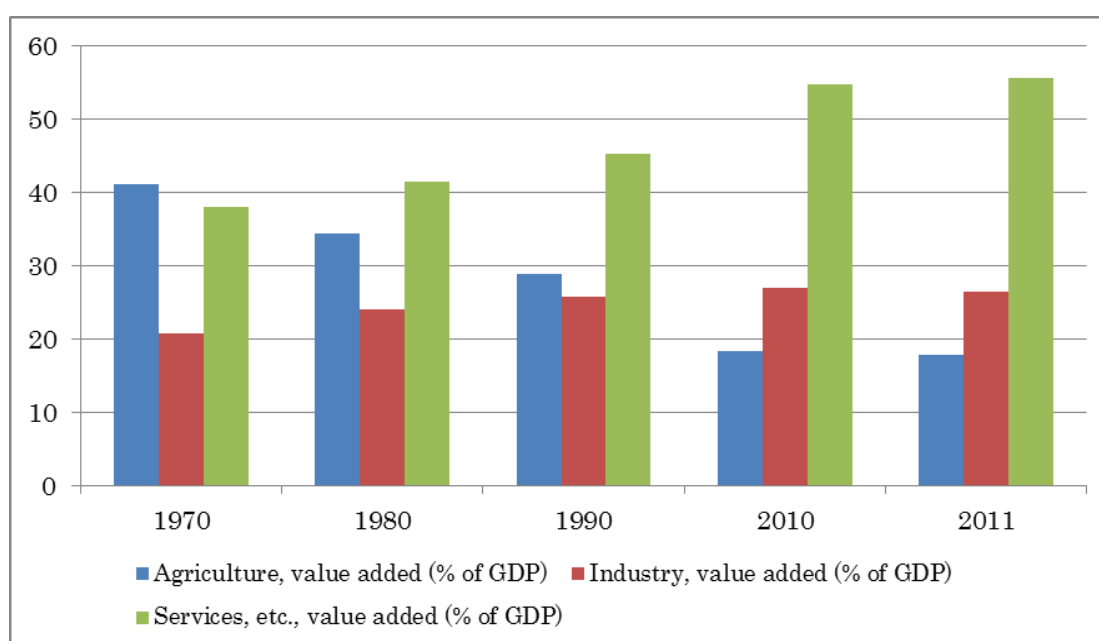
Source: World Bank 2012a (World Development Indicators 2012. Available: http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2012, accessed 16 August 2012).

Prior to 1980, South Asia was characterized by persistent conflicts, violence, low per capita income, poor social indicators, widespread poverty, and low savings rates (Ahmed 2006; Ahluwalia 2002). Sluggish GDP growth rates seen in the 1960s and 1970s started to pick up in the1980s (Figure 3), thanks to several initiatives such as domestic and external liberalization, and expansionary fiscal policies. Further policy shifts occurred in the 1990s when stabilization and structural reform programs were adopted to tackle fiscal and external imbalances that arose from the expansionary policies. These reform programs included several liberalization schemes for trade and investment, including tariff reduction, quota removal, and dismantling of industrial licensing (Ahluwalia 2002).

Figure 3: GDP Growth Rate of South Asia
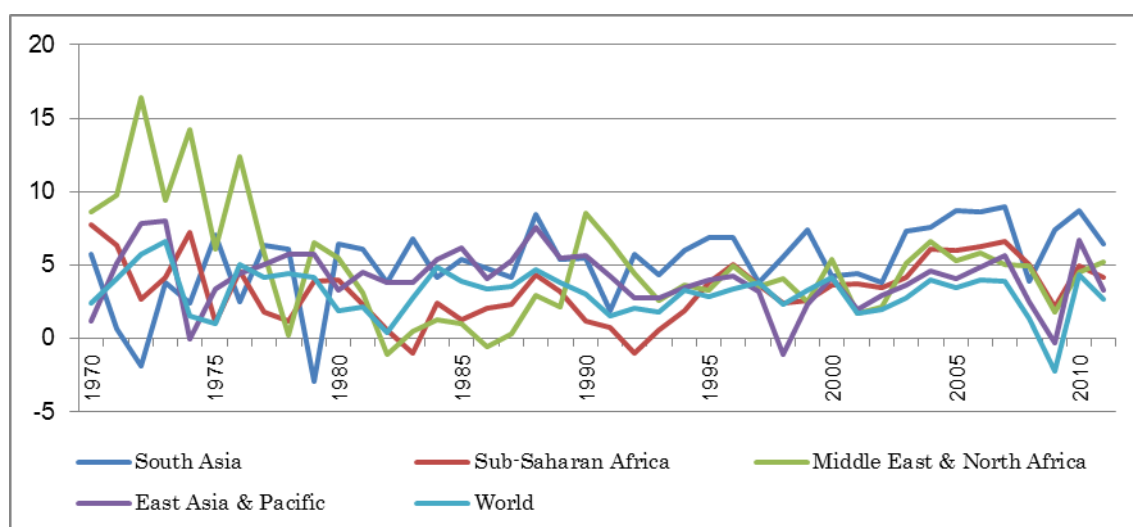
For a long time, South Asia performed poorly in international trade, and lagged behind other regions in terms of integration with global markets. Import-substituting policies, along with restrictive trade and industrial rules constrained these economies' regional and global trade expansion until 1990. The region's average share of trade in GDP was lower than 20% in 1990, largely because of low exports ($28 billion in the same year) (World Bank 2012a). Compared to other regions, intraregional trade among the South Asian economies was also very limited, amounting only 2.9% in 1990 (ADB 2012a). Since the early 1990s, however, several attempts have been initiated to boost South Asian trade integration through a number of trade pacts at the bilateral, regional, and multilateral levels. Economic integration under the SAARC regime was not explicitly envisaged until as late as the 1990s (Box 1). Since then, the South Asian economies have forged the South Asian Free Trade Area (SAFTA), which came into force in 2006 following a decade-long preferential trading arrangement.[4] SAFTA is expected to trigger intraregional trade and improve the competitiveness of the region's economies vis-à-vis the global partners (Box 2). Together with SAFTA, several bilateral initiatives—albeit at different stages of progress—between India-Sri Lanka, India-Bangladesh, Bangladesh-Sri Lanka, and Pakistan-Sri Lanka are shaping the regional economic geography of South Asia (SATIN 2008:3). Additionally, some countries also went beyond the region in their move towards integration; they have signed or are negotiating a number of free trade agreements with many countries outside Asia.

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[4] The South Asian Preferential Trading Arrangement (SAPTA), which was initiated in 1995. The SAPTA regime was eventually succeeded the SAFTA.

Box 1: Evolution of Economic Integration in South Asia

First South Asia Foreign Secretaries' Meeting, 1981
    Technical Co-operation in five selected areas (agricultural, telecommunication, rural development, meteorology, and health and population)
First South Asia Foreign Ministers' Meeting, 1983
    Launched the Integrated Programs of Actions through South Asian Regional Cooperation foreign ministers began to meet on a regular basis
Establishment of SAARC, 1985
    Objectives are defined on a wide range of issues, including: promoting welfare, accelerating economic growth, strengthening collective self-reliance, etc.
    A Secretariat was set up in Nepal
    A set of IPAs is discussed under SAARC
South Asian Preferential Trading Arrangement (SAPTA), 1995
    Signed in 1993 by the Council of Ministers
    Operational in December 1995; notified the WTO as a PTA
Different rounds of tariff cut under SAPTA
    SAPTA-1 (226 6-digit HS items) concluded in 1995
    SAPTA-2 (1800 6-digit HS items) concluded in 1997
    SAPTA-3 (2700 6-digit HS items) concluded in 1998
    SAPTA-4 initiated in 1999 but postponed. Talks began again in 2002.
South Asian Economic Union (SAEU) – Stage 1: Setting up of a Free Trade Area (SAFTA)
    Agreed in 1996 to move toward SAFTA by 2005
    In 1997, the above deadline brought forward to 2001
    The postponed 11th SAARC summit held in January 2002 directed the Council of Ministers to finalize the draft SAFTA treaty by the end of 2002
    The Group of Eminent Persons (GEP) Report (SAARC Secretariat, 1999) recommended setting up SAFTA by 2008 (for LDC members this deadline is 2010)
SAEU – Stage 2
    Setting up of a South Asian Customs Union (SACU) by 2015 (the GEP Report)
SAEU – Stage 3
    Setting up of an SAEU by 2020 (the GEP Report)
South Asian Free Trade Area
    Signed in 2004 by Foreign Ministers of Member Countries
    Operational since 1 January 2006 with difficulties relating to its implementation.
SAARC Agreement on Trade in Services (SATIS)
    Signed in 2010 at the 16th SAARC Summit in Thimphu
    Adjunct to the SAFTA Agreement; will be operational upon ratification by the member countries.

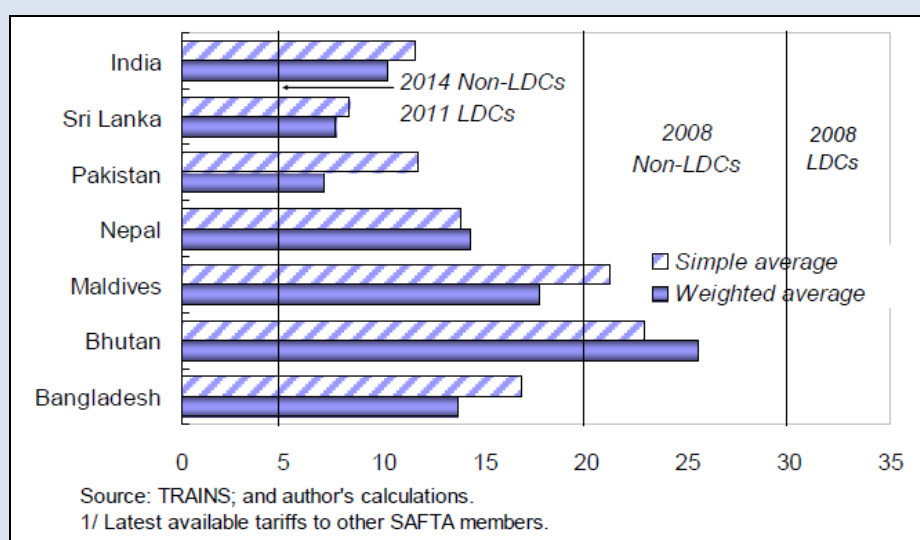Source: Bandara and Yu (2003) with updates by the author.

Box 2: Overview of South Asian Free Trade Area (SAFTA)

The overall goal of the SAFTA regime is "to strengthen intra-SAARC economic cooperation to maximize the realization of the region's potential for trade and development for the benefit of their people" (Preamble of the SAFTA Agreement). The Agreement calls for promoting and enhancing mutual trade and economic cooperation among the member states by means of eliminating barriers to trade and facilitating the cross-border movement of goods between the member states, promoting conditions for fair competition and ensuring equitable benefit for all the member states, and establishing a framework for further regional cooperation.

Governed by the principles of the Marrakesh Agreement Establishing the World Trade Organization (WTO), the member states foresee SAFTA to be "based and applied on the principles of overall reciprocity and mutuality of advantages in such a way as to benefit equitably all Contracting States, taking into account their respective levels of economic and industrial development, the pattern of their external trade and tariff policies and systems". The SAFTA Agreement reiterates the urgency of addressing the needs of the least-developed SAFTA countries, viz. Bangladesh, Nepal, Bhutan and Maldives. SAFTA involves the elimination of tariffs, paratariffs and nontariff barriers, and calls for the "adoption of trade facilitation and other measures, and the progressive harmonization of legislations by the Contracting States in the relevant areas."

Trade Liberalization Program

Figure B2-1: SAFTA's TLP Schedule 1/ (In %)

Source: TRAINS; and author's calculations.
1/ Latest available tariffs to other SAFTA members.

Source: Rodríguez-Delgado (2007)

SAFTA's trade liberalization program addresses both tariff and non-tariff barriers. The member states of SAFTA envisage a ten-year gradual phase out of tariffs starting from the date of coming into force of the Agreement, i.e., 1 July 2006. The member states are committed to reducing tariffs in two stages, although the pace of reduction is different for the least-developed members and non-least developed members (Figure B2-1). The reduction process is summarized below:

- Non-least developed member states will reduce tariffs from existing rates to a maximum of 20%. Tariffs already below 20% will be reduced on a margin of preference basis of 10% on actual tariff rates annually. This reduction will be executed over the first two years from the date of coming into force of the Agreement. In the second phase, non-least developed member states will reduce tariffs to between 0% and 5% by the third year for products from least developed member states and over 5 years for the remainder at a rate of no less than 15% annually. However, the period of subsequent tariff reduction by Sri Lanka shall be 6 years.

- Least developed member states will reduce tariffs from existing rates to a maximum of 30%. Tariffs already below 30% will be reduced on a margin of preference basis of 5% on actual tariff rates annually. This reduction will be executed over the first two years from the date of coming into force of the Agreement. In the second phase, least developed member states will reduce tariffs to between 0% and 5% over 8 years at a rate of no less than 10% annually.

Source: Moinuddin 2008; Rodríguez-Delgado 2007; SAARC Secretariat 2004; WTO 1994.

These recent developments on the external front in South Asian trade policy have had a positive effect on growth in exports and trade, although it was not as dramatic as what the East Asian economies had experienced. Unlike in the 1970s and 1980s, individual South Asian economies at present are much more open to and integrated with the global economy, which is reflected by the steady rise in their average share of trade in GDP (Table 1). Trade comprised over a quarter of India's GDP in 2000, but within a decade the ratio increased to more than half of the country's GDP. Trade growth in India was primarily triggered by the reduction in trade taxes and a more efficient trade processing regime. Other South Asian countries, particularly Bangladesh, also experienced rapid increase in trade, thanks to the reductions in trade barriers which paved the way for substantial increases in labor-intensive exports of ready-made garments. The trade to GDP ratio in Bangladesh rose more than 20 percentage points, from 33.2% in 2000 to 53.9% in 2011. Sri Lanka already had an open trading regime, with an openness ratio of 88.6% in 2000 which fell to 60.3% in 2011. Nepal, which depends heavily on India for its external economic relations, had an openness ratio of 41.7% in 2011. Pakistan, however, staggered due to lack of diversification of its export commodities. South Asia as a whole improved its trade to GDP ratio significantly, from 29.4% in 2000 to 51.3% in 2011.

Table 1: Average Share of Trade in GDP

(%)

Country	1970	1980	1990	2000	2010	2011
Afghanistan	21.7				69.0	0.0
Bangladesh	20.8	23.4	19.7	33.2	43.4	53.9
Bhutan			61.3	81.8		
India	7.5	15.1	15.2	26.5	49.7	54.5
Maldives		358.7	168.1	161.1	107.6	
Nepal	13.2	30.3	32.2	55.7	46.0	41.7
Pakistan	22.4	36.6	38.9	28.1	32.3	27.8
Sri Lanka	54.1	87.0	68.2	88.6	52.5	60.3
South Asia	11.7	20.6	20.0	29.4	47.5	51.3

Source: World Bank 2012 (World Development Indicators 2012. Available: *http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2012*, accessed 20 August 2010).

The pattern of trade of the South Asian economies in recent decades suggests that these economies trade more with the extraregional partners than with their regional partners. All the South Asian economies depend heavily on the advanced markets of Europe, Japan, and the United States as the destination of the export commodities. A similar trend can be observed for imports by the South Asian countries. Recently, the PRC has been becoming an increasingly important trading partner of India as well as other South Asian countries. The empirical analysis of this paper takes into consideration 37 selected extraregional countries that have significant trade relations with the South Asian countries.[5] Figure 4 demonstrates

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[5] The selection includes 6 South Asian countries (excluding Afghanistan and Bhutan) and 37 non-South Asian countries:

South Asia: Bangladesh, India, Maldives, Nepal, Pakistan, and Sri Lanka.

Southeast Asia: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam.

Other Asian: Australia; the People's Republic of China (PRC); Republic of Korea; Hong Kong, China; and Japan.

Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

South Asia's export and import dependence on these 37 countries since 1995. Over the last two decades, these selected countries consistently accounted for more than half of South Asia's total exports as well as imports. [6] Even with the decline in the relative export dependence of South Asia on these selected extraregional countries in 2010, it is unlikely that the pattern will change drastically any time soon.

Figure 4: South Asia's Export and Import Dependence on 37 Selected Trading Partners since 1995
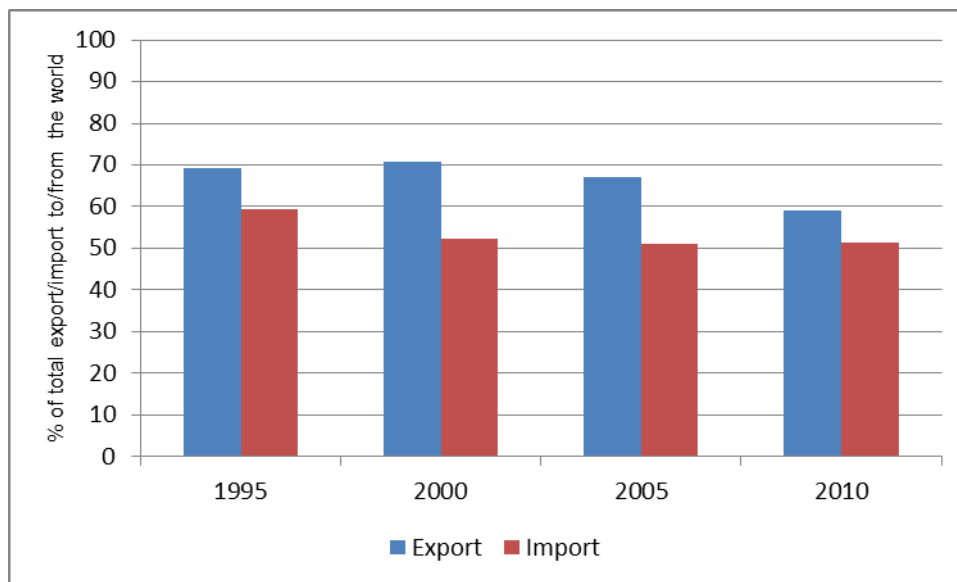
Notes: The graph represents the ratio of South Asian economies' (excluding Afghanistan and Bhutan) total exports to and total imports from the selected 37 countries (as a group) and the world.

Source: Author's calculations from IMF 2012a (Direction of Trade Statistics 2012CD-ROM).

While all the South Asian economies embraced enhanced global integration, their intraregional integration has remained significantly low, marked by slow growth in intraregional trade. Existing as an integrated region until 1947, South Asia's intraregional trade (as a percentage of total trade) was double-digit until the middle of the 20th century (Raihan 2012). However, the subsequent decades saw a drastic decline and the intraregional trade share hovered below 3% until the end of 1980s. South Asia's trade with both its regional and external partners began to recover from the 1990s (Figure 5), although the pace of trade growth with external partners has been faster than with regional partners. In 1990, South Asia's total trade within the region and with the world amounted to $1.8 billion and $66.2, billion respectively. By 2011, the region's global trade had increased to $951.1 billion, while within-region trade had grown to $40.5 billion (Table 2).

North America: Canada, Mexico, and the United States.

South America: Argentina, Brazil, Paraguay, Uruguay.

[6] Although some other countries, particularly from the Middle East, also enjoy significant trade relations with South Asia, they have not been included in the list of selected countries due to unavailability of overall data for the empirical analysis of this paper. Nonetheless, the strong trade relations between the South Asian countries and the selected extraregional countries provide a good basis for the empirical study.

Figure 5: South Asia's Intraregional Trade
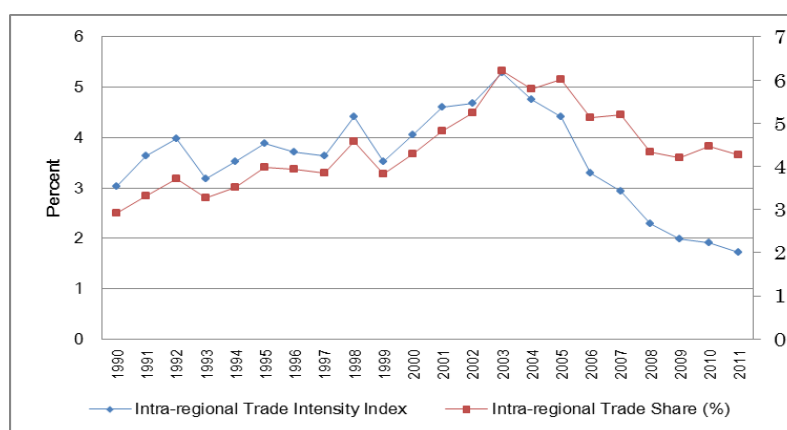
Notes: The Intra-regional trade intensity index is the ratio of the intra-regional trade share to the share of world trade with the region, calculated using exports data. An index of more than one indicates that trade flows within the region is larger than expected given the importance of the region in world trade. Intra-regional trade share is the percentage of intra-regional trade to total trade of the region, calculated using exports data. A higher share indicates a higher degree of dependency on regional trade.

Source: ADB 2012a (Asia Regional Integration Center (ARIC) Integration Indicators Database).
Available: http://aric.adb.org/indicator.php, accessed 20 August 2012).

Table 2: South Asia's Total Trade Within the Region and With the World

Reporter	South Asia			
Partner	South Asia		World	
Indicator	Total Trade, in billion US$	Total Trade Growth (%)	Total Trade, in billion US$	Total Trade Growth (%)
1990	1.8	N/A	66.2	N/A
1991	2.0	12	64.1	(3.3)
1992	2.6	30.8	72.7	13.5
1993	2.6	(1.7)	73.9	1.6
1994	3.0	18.5	82.3	11.4
1995	4.4	43.3	104.4	26.9
1996	5.0	15.9	111.8	7
1997	4.8	(4.5)	119.7	7.1
1998	5.8	19.7	118.8	(0.7)
1999	5.1	(11)	129.2	8.8
2000	6.2	21.7	142.8	10.6
2001	6.9	10.2	141.5	(0.9)
2002	7.7	12	158.2	11.8
2003	10.8	40.8	192.9	21.9
2004	13.2	22.1	244.7	26.9
2005	17.3	30.6	324.1	32.5
2006	20.3	17.2	401.2	23.8
2007	26.6	31.2	508.3	26.7
2008	29.1	9.6	600.3	18.1
2009	22.7	(22)	538.0	(10.4)
2010	33.2	45.9	719.9	33.8
2011	40.5	22.1	951.1	32.1

( ) = negative.

Source: ADB 2012a (Asia Regional Integration Center (ARIC) Integration Indicators Database).
Available: http://aric.adb.org/indicator.php, accessed 20 August 2012).

In spite of some increase in South Asia's intraregional trade in recent years, the region continues to be one of the least integrated in the world. Figure 6 provides a comparative picture of intra-regional trade shares of South Asia, Association of Southeast Asian Nations (ASEAN) and ASEAN+3 countries. It clearly shows that the other two regions are much ahead of South Asia in terms of regional integration; in 2011, South Asia's intraregional trade was only 4.3% whereas corresponding figures for ASEAN and ASEAN+3 were 26% and 39%, respectively.

Figure 6: South Asia Lags Behind other Asian Regions in terms of Integration
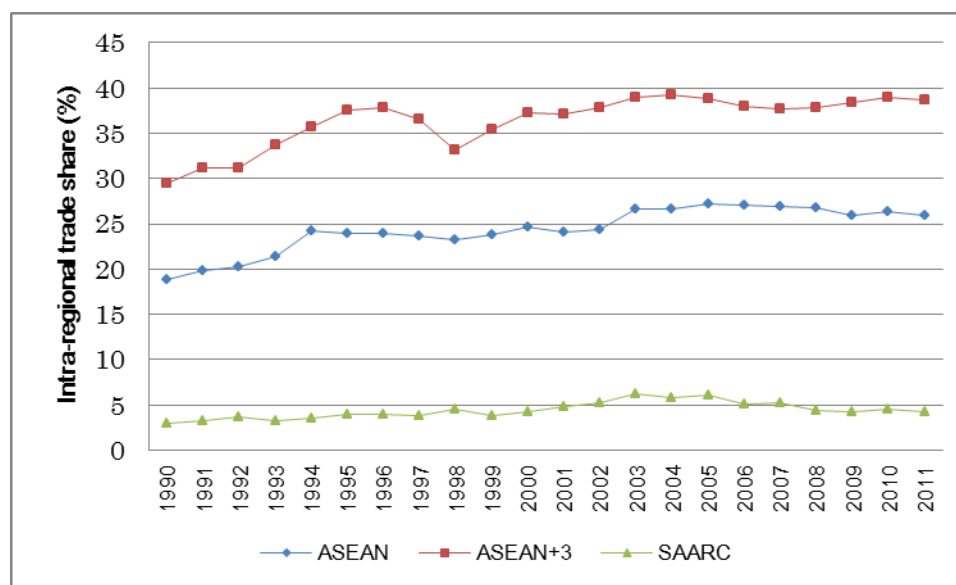
Source: ADB 2012a (Asia Regional Integration Center [ARIC] Integration Indicators Database.
Available: *http://aric.adb.org/indicator.php* (accessed 20 August 2012).

Table 3 presents individual South Asian countries' exports to, imports from, and total trade with the South Asian region as percentage of the respective countries' total exports, total imports, and total trade. The data shows that these countries in general trade more with external partners than with each other. For example, in 2011, India's trade with other South Asian countries accounted for only 2% of its total trade. In other words, 98% of India's trade occurred with the rest of the world. The same is true for all other South Asian countries with the exception of Nepal. Additionally, barring Afghanistan and Nepal, all these countries depend heavily on markets outside South Asia as their export destinations.

For a prolonged period of time, South Asian countries maintained high tariff barriers and other protectionist measures. Following the policy changes of the 1990s, many South Asian economies progressively reduced their tariff rates under their trade liberalization initiatives as well as in line with their WTO obligations. Several rounds of tariff reductions also took place under the SAPTA regime. The trade liberalization program (TLP) of SAFTA envisages a ten-year gradual phase-out of tariffs among the member countries. Figure 7 presents the declining trend in simple average mean applied tariff rates of South Asia. While in 1998 the regional average was over 44%, by 2010 it had fallen to just above 10%. Despite these initiatives, major South Asian countries—India, Pakistan, and Bangladesh—still maintain significantly high tariff rates. In fact, average tariff rates in South Asia as a whole are higher than the average of other regions (Raihan 2012).

Table 3: Share of Intraregional Trade in South Asia

Country	1990	1995	2000	2005	2010	2011
Export Share (%)[a]						
Afghanistan	14.2	13.1	42.4	42.8	54.4	62.4
Bangladesh	3.7	2.7	1.7	2.2	2.9	3.3
India	3.1	5.1	4.3	5.3	4.9	4.4
Maldives	14.0	22.6	18.1	17.4	34.3	19.0
Nepal	7.7	9.2	42.9	67.4	65.5	61.0
Pakistan	4.0	3.4	4.6	11.2	12.4	12.5
Sri Lanka	3.8	2.7	3.5	10.3	7.4	8.2
Import Share (%)[b]						
Afghanistan	14.5	10.2	27.3	44.7	28.4	26.1
Bangladesh	6.8	17.7	11.7	15.2	15.7	15.6
India	0.5	0.6	0.9	0.9	0.5	0.5
Maldives	12.2	13.2	23.0	17.4	15.2	14.4
Nepal	13.4	17.2	37.4	59.7	57.4	57.4
Pakistan	1.7	1.6	2.7	3.0	6.3	4.3
Sri Lanka	7.0	12.2	10.6	22.4	25.7	27.4
Trade Share (%)[c]						
Afghanistan	14.5	11.1	30.1	44.6	29.8	27.6
Bangladesh	5.8	12.8	7.9	10.3	11.3	11.3
India	1.6	2.7	2.4	2.7	2.2	2.0
Maldives	12.7	14.3	22.2	17.4	17.1	14.9
Nepal	11.9	14.8	39.1	61.9	58.8	57.9
Pakistan	2.7	2.3	3.5	6.2	8.4	7.0
Sri Lanka	5.6	7.8	7.4	17.3	19.3	21.1

Notes:

a. Export share is the percentage of exports going to a partner to total exports of a country/region. A higher share indicates a higher degree of integration between partner countries/regions.

b. Import share is the percentage of imports from a partner to total imports of a country/region. A higher share indicates a higher degree of integration between partner countries/regions.

c. Trade share is the percentage of trade with a partner to total trade of a country/region. A higher share indicates a higher degree of integration between partner countries/regions.

Source: Source: ADB 2012a (Asia Regional Integration Center (ARIC) Integration Indicators Database. Available: *http://aric.adb.org/indicator.php*, accessed 20 August 2012).

While there is plenty of literature on the potential of free trade agreements in other regions of the world, South Asia as a regional grouping has only recently started to generate the interest of scholars. Several studies have been conducted using different methodologies and the issue of whether the SAFTA regime will be beneficial for South Asia as a whole as well as for individual countries still remains a matter of considerable debate. The next sections of this paper will review some of these studies within the context of different empirical methods used in analyzing trade effects of regional instruments, and then develop an empirical estimation of the gravity model to analyze the determinants and trade effects of SAFTA.

Figure 7: Declining Trend in Simple Average Mean Applied Tariff Rates of South Asian Economies
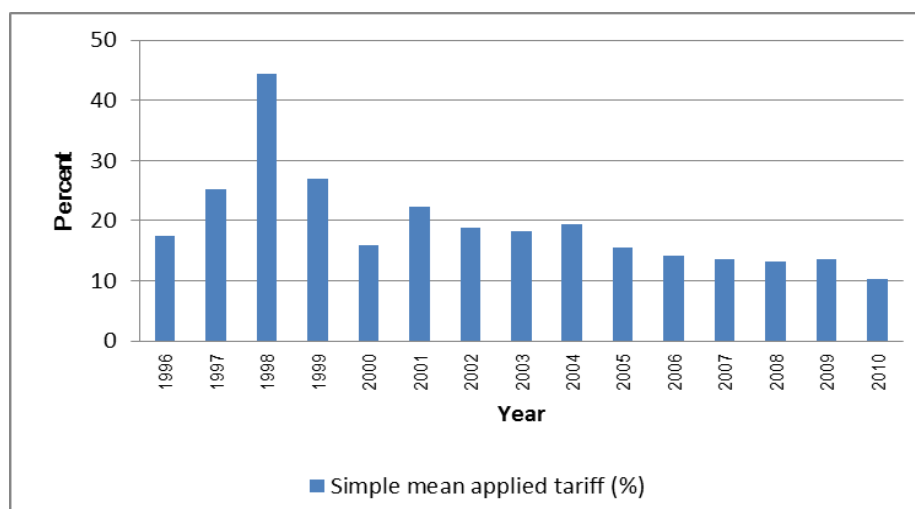
Notes: Simple mean applied tariff is the unweighted average of effectively applied rates for all products subject to tariffs calculated for all traded goods.

Source: World Bank 2012a (World Development Indicators 2012. Available: *http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2012*, accessed 18 August 2012).

3. EMPIRICAL METHODS FOR ANALYZING TRADE POLICY

A growing body of studies uses empirical methods for quantitatively analyzing trade policy. Analytical models help provide a way of evaluating trade and economic policies in a theoretically consistent manner and thus facilitate policymaking processes. Analytical models are chosen based on the purpose of a specific study. For estimating the future impact of different trade policies, *ex ante* studies use simulations with partial or general equilibrium models. For quantifying the actual effects of trade policies already implemented, *ex post* econometric studies are used. Two commonly used analytical techniques for assessing the impact of free trade agreements (FTA) are gravity models (*ex post)* and computable general equilibrium (CGE) models (*ex ante).* Unlike partial equilibrium models, both gravity and CGE models offer general equilibrium approaches, taking into account the linkages between several interacting markets.

3.1 Computable General Equilibrium (CGE) models

Researchers use CGE models to analyze large scale policy changes—prior to their implementation—based on the present economy as a benchmark, which enables policymakers to measure the impact of policies (Ivus and Strong 2007). As an economy-wide model, the CGE approach "describes the motivations and behavior of all producers and consumers in an economy and the linkages among them" (Burfisher 2011). Such way of quantifying the impact of policies with CGE models has its origin in the input-output models pioneered by Leontief (1951), but improved significantly by others, including Johansen (1960) who applied non-linear models for identifying the sources of growth.

CGE models have been extensively used in analyzing a wide range of economic issues such as taxation, development policies, and climate change. Initially, the application of CGE models focused mainly on tax policies (for example, Shoven and Whalley 1984, and Pereira and Shoven 1988). Since the early 1990s, there has been an increasing use of CGE models for studying the prospective effects of the formation of FTAs, including those covering the

East Asian economies (Francois and Wignaraja 2009).[7] Different methodologies and underlying economic structures have been used in these studies, but quite often they were built on the popular Global Trade Analysis Project (GTAP) database. Some of the studies involving the South Asian economies are reviewed in the next section of this paper.

In spite of their advantages in terms of the impact analysis of future policy changes, CGE modeling has a number of caveats. The simulations conducted using CGE modeling are conditional on assumed circumstances and year, which are most likely to change over time. For instance, the derived conclusions on trade policy will depend on the assumed levels of trade restrictions. Additionally, CGE models are rather more theoretical than empirical because of the difficulties of testing against experience (GTAP 2012). Overall, the findings derived from using a CGE model are very sensitive to how the model is structured and specified, how the parameters are calibrated, how the "closure rules" are specified, what base year is chosen, and the data quality for the base year (Charney and Vest 2003).

3.2 Gravity Models of International Trade

The gravity model has established itself as a pioneer in estimating trade flows between countries. The model, named after the Newtonian physics notion, was first used by Jan Tinbergen in 1962 in his famous book entitled *Shaping the World Economy: Suggestions for an International Economic Policy.* Contemporary economist Pentti Pöyhönen also developed a gravity-type model for estimating the volume of trade between countries (Pöyhönen 1963). The model soon became a popular tool for empirical trade approaches and has also been used in other areas such as foreign direct investment and migration (Ivus and Strong 2007). The conventional gravity model stipulates that bilateral trade between two countries is positively related to their economic and physical size (proxied by GDP and land area), and inversely related to transaction costs (such as distance, adjacency, culture, etc.). Recent uses of the gravity model have seen significant augmentations of the basic model with a number of other variables such as population and per capita income.

By default, gravity models provide *ex-post* analyses with results expressed in actual effects. The model is empirically robust, and it is the base point for estimating trade diversion and trade creation (Krugman and Obstfeld 2006). Gravity models' frequent application in empirical studies on international trade contributed to the improvement of the performance of gravity equations. The basic econometric specification of the gravity model has been significantly improved by the works of Matyas (1997) and (1998), Chen and Wall (1999), Breuss and Egger (1999), and Egger (2000). On the other hand, Berstrand (1985), Helpman (1987), Wei (1996), Soloaga and Winters (2001), Limao and Venables (1999), and Bougheas et al. (1999) contributed to the refinement of the explanatory variables considered in the analysis and to the addition of new variables. To address the effect of an FTA on the direction of trade, initially the basic gravity model was extended with the inclusion of one single regional dummy to capture the effect of the FTA on intra-regional trade; another set of dummies was included in later works to capture the FTA's trade diversion effects on non-members (Soloaga and Winters 2001).

The model has been applied in a number of sophisticated studies on the trade effects of regional trading blocs such as the North American Free Trade Area (NAFTA). Krueger (2001) applied a gravity model to investigate trade creation and trade diversion effects in North America, and found that NAFTA had insignificant effects on trade patterns. Soloaga and Winters (2001) modified the basic gravity model to quantify the effects of newly created or revamped FTAs on trade, and found similar insignificance of NAFTA. Montanari (2005) used a gravity framework to analyze trade between the European Union and the Balkan

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[7] For a concise summary of these studies covering East Asian FTAs, see Francois and Wignaraja (2009): 490–497.

countries, while Kien and Hashimoto (2005) investigated the determinants of trade flows of the ASEAN Free Trade Area (AFTA). Relatively fewer studies have been conducted on South Asia (see next section for a review of selected studies).

The gravity model has been one of the most successful empirical methods with good fit and relatively tight clustering of coefficients (Anderson 2011). The model possesses high explanatory power (Ivus and Strong 2007), and can be used not only for explaining trade flows, but also other types of flows such as migration, commuting, and tourism (Bergstrand 1985). Despite its success, the model initially lacked a strong theoretical foundation, which led to criticism, particularly concerning its use for predictive purposes (Bergstrand 1985). Theoretical progress has taken place since the late 1970s through the works of, among others, Anderson (1979, 2011), Bergstrand (1985, 1990), and Deardorf (1998). Some critics also argue that gravity models are unable to capture the welfare effects of an FTA because the left-hand side of a gravity equation is not welfare but bilateral trade (Raihan 2012). Despite these criticisms, gravity models have become "the workhorse for empirical studies" (Eichengreen and Erwin 1998: 33) and "have produced some of the clearest and most robust empirical findings in economics" (Leamer and Levinsohn 1995: 1,384).

The purpose of the present study is to examine the determinants of trade flows among these economies and actual effects that the SAPTA and the SAFTA regimes have generated since their inception. In other words, this paper intends to conduct an *ex post* examination, not an *ex ante* examination. While CGE models may have some advantages in analyzing future policy changes, it does not serve the purpose of the present study of testing the actual effects. As such, a gravity model is a more suitable and appropriate analytical tool for this study.

4. REVIEW OF SELECTED LITERATURE ON THE IMPACT OF ECONOMIC COOPERATION AND INTEGRATION AMONG SOUTH ASIAN ECONOMIES

The rapid proliferation of free trade agreements in Asia and elsewhere in the world over the last few decades has generated a great deal of enthusiasm among scholars for assessing the impact of such   bilateral regional arrangements. However, while there is plenty of literature exploring the potential of FTAs in East and Southeast Asia, the South Asian region has received limited attention largely because of its low share in intraregional and global trade. It was only after economic cooperation was envisaged under the SAARC regime that scholars started to pay attention to the region. Although limited, these empirical studies initiated the debate over the desirability of a South Asian free trade area. A preferential regime has been in place in South Asia since the mid-1990s, but available studies are inconclusive about the potential for the region's economic integration.

Govindan (1994) applied a partial equilibrium framework in the food import regime of selected South Asian economies. His econometric estimates, which included the effects of a preferential trading arrangement in the region, found that such a preferential regime would expand intraregional trade in food and thus generate welfare gains. Coulibaly (2004) estimated the trade creation and trade diversion effects of several regional trade agreements (including SAPTA, the preferential arrangement that was existing before the inception of SAFTA) using an extended gravity model. It found that SAPTA was net trade creating. Some other studies, such as Hirantha (2004) and Tumbarello (2006), found similar trade creating effects arising from SAPTA. Rahman, Shadat, and Das (2006) applied an augmented gravity model to SAPTA and nine additional regional trading blocs. Their study found significant intraregional trade creation in SAPTA, but warned that net export diversion would also take place. The study found that the larger economies of the region—India, Pakistan, and Bangladesh—would gain from SAPTA but the others might be adversely affected.

Some authors, however, expressed less optimism about South Asia's economic integration potential. The gravity model results of Srinivasan (1994) and Srinivasan and Canonero (1995) suggested that the region would gain more from unilateral trade liberalization as opposed to preferential liberalization. A regional (SAARC) dummy was also found to be insignificant in the study by Rahman (2003). A more recent study by Rodrígueez-Delgado (2007) used a modified gravity equation to examine the effects of SAFTA's trade liberalization program. It argued that SAFTA would have only limited effects on regional trade flows, arising basically from increasing exports from India, and imports from Bangladesh and Nepal.

A few studies have also been conducted covering the South Asian economies within a CGE framework. Like the econometric analyses, CGE estimations have produced mixed results for the trade potential of SAFTA. Bandara and Yu (2003) used the GTAP model with 1997 as the base year to conduct policy scenarios on unilateral and preferential trade liberalizations of South Asian economies as well as alternative scenarios involving South Asia–ASEAN, South Asia-NAFTA, South Asia-EU, and full multilateral liberalization. The study found that South Asia would gain more from a multilateral approach or through SAFTA-NAFTA and SAFTA-EU FTAs than a preferential approach involving only the South Asian economies. A similar study by Siriwardena (2003), which analyzed a South Asian FTA scenario and a customs union scenario, however, found gains for South Asian economies under both scenarios, with the latter accounting for higher gains. A more recent study was conducted by Raihan (2012) using GTAP version 8 with 2007 as the base year. It considers only one scenario involving a full FTA in goods among the South Asian economies with a 25% reduction in intra-SAARC trade costs. According to this study, the FTA with trade facilitation proves to bring welfare gains for all the countries taken into consideration. Using GTAP version 6 dataset benchmarked to 2001, Francois and Wignaraja (2009) conducted a more comprehensive study with three core scenarios—ASEAN+3 FTA, ASEAN+3 and India FTA, and ASEAN+3 and South Asia FTA. Under the first scenario, the main gainers are Japan, Republic of Korea, and Malaysia. India gains quite strongly under the second scenario. The broad scenario bridging ASEAN+3 and South Asia demonstrates substantial gains for all the South Asian economies, particularly Bangladesh, India, Nepal, Pakistan, and Sri Lanka.

Although all these studies differ in terms of methodology and data coverage, the inconclusiveness of the findings calls for further quantitative examination of South Asia's economic integration potential. As SAFTA has already become operational, such examinations are likely to assist policymakers in guiding the regional forum in the optimal direction. The next section of this paper will develop an empirical specification of an augmented gravity model to estimate the determinants and effects of trade flows of South Asian economies.

5. A GRAVITY MODEL FOR SOUTH ASIAN FREE TRADE AREA (SAFTA)

5.1 Model Specification and Data

The empirical analysis of this paper uses a dataset for 43 countries, selected taking into consideration their importance with regard to South Asia's trade.[8] With the exception of Lao PDR, all the sample countries are members of the WTO. While the number of FTAs—both multilateral and bilateral—that these countries comprise among themselves is numerous, the study focuses on only one FTA, i.e., the SAFTA. This is reasonable because, first, this study intends to focus primarily on South Asia's regional integration, and second, there is an

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[8] See Footnote 5 in Section 2 for the list of these 43 countries. Two South Asian economies, Afghanistan and Bhutan, have not been included in the analysis due to data unavailability.

abundance of studies on the trade effects of FTAs in other regions. The data range covers the period 1992–2011.

This paper has designed a panel framework to cover trade variations among the sample countries. Panel estimations are expected to generate several advantages over cross section and time series data in terms of controlling individual heterogeneity, offering more variability and reducing the collinearity among the independent variables (Do 2006).

In international trade, bilateral trade flows are often explained using the following baseline specification of the gravity model:

$$\log X_{ijt} = \beta_0 + \beta_1 \log Y_{it} + \beta_2 \log Y_{jt} + \beta_3 \log D_{ij} + \log u_{ijt} \qquad (1)$$

where,

X_{ij} = exports from country i to country j at time t

Y_i = GDP of the exporter country i at time t

Y_j = GDP of the importer j at time t

D_{ij} = distance between the trading countries i and country j

$\log u_{ij}$ = error term, where $E(\log(u_{ij})) = 0$.

By default, the model holds that exports from country i to country j at time t will depend on the GDP of countries i and j, and the distance between these two countries. It assumes that larger economies trade more, and hence the coefficients of both exporter and importer GDPs are expected to be positive. On the other hand, the coefficient on distance is expected to be negative, since the remoteness increases transaction costs.

The baseline specification of the model, however, does not take into account the likely bias that may result from heterogeneous factors. For example, it is possible that a country may export different amounts of a specific good to two different countries even when the importing countries are identical and have the same distance from the exporting country. Therefore, recent empirical studies have often included other variables such as population, common border, and common language.

Most empirical literature on gravity models uses total bilateral trade flows as the dependent variable. However, FTA effects are better estimated if bilateral export flows are taken into consideration, as with total bilateral trade one cannot distinguish between the impacts of FTA formation on exports from a non-member to the FTA members from that on exports from an FTA member to a non-member (Cernat 2001).

The model in this study estimates the log-linear form of the gravity equation. The dependent variable is the total volume of exports, in log form, from country i to country j. The values of bilateral merchandise exports (expressed in FOB terms in American dollars) are obtained from the International Monetary Fund's Direction of Trade Statistics (IMF 2012a). The model is estimated for a country panel dataset of one FTA and 43 countries.

The data related to GDP and population is collected from the World Bank's World Development Indicators (World Bank 2012a). The coefficient on the population variable, as a proxy to the market size, is expected to be negative for both the exporting and the importing countries due to absorption capacity (Endoh 1999). However, the exporters' population coefficient can bear either a negative or a positive sign, depending on whether the country exports less when it is big (absorption capacity) or whether a big country exports more compared to a small country (economies of scale) (Martinez-Zarzoso and Nowak-Lehman 2003).

Bergstrand (1985) and Dell'Ariccia (1999) suggest that it is empirically justified that the inclusion of an explanatory variable on exchange rate is statistically significant in explaining

variations in trade among the countries in question.[9] It captures the impact of depreciation or appreciation of the exporting country's currency to that of the importing country, and is considered significant when it has a positive sign. This study therefore includes foreign exchange in its model estimation. Country-pair foreign exchange rates are calculated by the author from the IMF's International Financial Statistics Database (IMF 2012b).

As a proxy for trade costs, the estimation in this study uses physical distance between two trading partners. Data on physical geographic distances, measured as great circle distances between capital cities, are obtained from the industry trade data available at http://www.macalester.edu/research/economics/page/haveman/trade.resources/tradedata.html#Gravity.[10] Several other studies have used additional dummy variables such as adjacency, colonial links, and common language as proxies for trade costs. This study, however, does not take into consideration these proxies. As the focus of the study is trade integration in South Asia, an assessment of the trends in South Asia's global and regional trade is necessary for formulating the gravity equation. Given that the South Asian countries tend to trade more with extraregional partners than with their neighbors, this study assumes that controlling for distance should make it unnecessary to include an additional variable on adjacency. Additionally, South Asian trade does not show any bias toward colonial connections or common languages. Since the study's database is developed for selected countries (based on South Asia's regional and global trade patterns) as opposed to a global database for all the major countries of the world, these proxies may be not be relevant for this study.

However, the basic gravity model in this paper has been augmented by adding the dimensions of trade openness and restrictions. Some of the previous studies, such as Rahman, Shadat, and Das (2006), used import-GDP ratio of the importing country to indicate the openness of the economy. This paper also adds a variable on import-GDP ratio which is expected to bear a positive sign, but also notes that the openness (or lack of openness) of an economy is better measured if the total tariff revenue of the importing country over its imports is also taken into account. The modified estimation in this paper therefore adds this variable, which is expected to have a negative sign. Furthermore, another variable denoting applied tariff of the importing country is added as a proxy for trade restrictiveness. Import-GDP ratio and tariff revenue-import ratio have been calculated by the author from the World Development Indicator database (World Bank 2012a), while tariff rates have been collected from the World Bank's Data on Trade and Import Barriers (World Bank 2011).

The export patterns of the South Asian countries have previously been influenced considerably by the so-called Multi-Fiber Agreement (MFA). The expiration of the MFA by the end of 2004 raised serious speculation about the future of South Asian exports. A dummy variable has been added to capture the effect of expiration of the MFA on South Asian economies. For the period until the expiry of the MFA, the dummy is unity when a South Asian economy enjoyed MFA preferences from the advanced economies of Europe and the United States (zero otherwise). It is consistently zero throughout the post-MFA period.

The dummy variable SAFTA captures the intra-regional trade creation effects. This regional dummy is used to isolate their influence on trade flows which would otherwise be absorbed in other variables used in the gravity model. A positive and statistically significant coefficient on this dummy will reflect that the members of the FTA have traded more with each other. The regional dummy is unity when both the exporting and the importing countries are

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[9] However, for obvious reasons, exchange rate coefficients were rather insignificant under the fixed exchange rates prior to the mid-1970s.

[10] The documents lack information of some countries. In such cases, distances between two countries are collected from http://www.chemical-ecology.net/java/lat-long.htm.

members of SAFTA (otherwise zero). The main purpose of this study is to investigate intra-regional trade creation, which is captured through a positive coefficient on these regional dummies. Dummies on individual membership of the FTAs therefore are not incorporated in the estimation.

In the sample dataset, some data (bilateral exports, for example) are missing for some dates. This study dropped all these missing values and only focused on observations with no missing values.

With these specifications, the main regression equation used in this study is as follows:

$$\log X_{ijt} = \beta_0 + \theta_t + \beta_1 \log Y_{it} + \beta_2 \log Y_{jt} + \beta_3 \log D_{ij} + \beta_4 \log N_{it} + \beta_5 \log N_{jt} + \beta_6 \log FX_{ijt} + \beta_7 \log IMGDP_{jt} + \beta_8 \log TAR_{jt} + \beta_9 \log TR_jIM_j + \beta_{10k} SAFTA_{(ij)t} + \beta_{11k} MFA_{(ij)t} + \log u_{ijt}$$
(2)

where,

X_{ijt} = Value of total export from country i to country j;

Y_{it} = GDP of country i at time t;

Y_{jt} = GDP of country j at time t;

D_{ij} = Distance between two countries;

N_{it} = Population of country i;

N_{jt} = Population of country j;

FX_{ijt} = Exchange rate between countries i and j at time t;

$IMGDP_{jt}$ = Import-GDP ratio of country j at time t;

TAR_{jt} = Applied MFN tariff rates of country j at time t;

TR_jIM_j = Ratio of total tariff of country j and total import of country j;

SAFTA= Dummy variable taking the value of 1 if countries i and j are part of the SAFTA, zero otherwise;

MFA= Dummy variable taking the value of 1 if countries i and j are part of the Multi Fiber Agreement, zero otherwise;

β_0 = Unknown constant;

θ_t = Time specific effects;

u_{ijt} = Error term, where $E(\log(u_{ijt}))$ equals zero.

South Asian economies in general have pursued quite stringent trade restrictive policies. Despite liberalization initiatives since the early 1990s, the region still maintains strict tariff and non-tariff measures that restrict their intraregional and global trade. This study conducted another regression to capture the effects of South Asia's trade restrictiveness. Kee (2009) has developed indices for measuring trade restrictiveness of the importing country j, and data used in the current study's estimation has been collected from Kee's Trade Restriction Indices (July 2012 updates). The Overall Trade Restrictiveness Index (OTRI) based on applied tariffs has been used. The OTRI "reflects the uniform equivalent tariff of a country's tariff schedule and non-tariff measures (NTMs) that would maintain the domestic import levels, including preferential tariffs."[11] As the OTRI data is available only for 2009, this regression has been conducted only for this year. The coefficient on OTRI is expected to bear a negative sign, indicating that higher trade restrictiveness deters trade flows among countries. The regression equation used is as follows:

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[11] This description has been taken from http://info.worldbank.org/etools/wti/3a.asp#

$$\log X_{ijt} = \beta_0 + \theta_t + \beta_1 \log Y_{it} + \beta_2 \log Y_{jt} + \beta_3 \log D_{ij} + \beta_4 \log N_{it} + \beta_5 \log N_{jt} + \beta_6 \log FX_{ijt} + \beta_7 \log IMGDP_{jt} + \beta_8 \log TAR_{jt} + \beta_9 \log TR_jIM_j + \beta_{10}k\ OTRI_{(ij)t} + \beta_{11}k\ SAFTA_{(ij)t} + \log \mu_{ijt}$$
$$(3)$$

5.2 Estimation Results and Analytical Discussion

This study conducts a panel least square regression with all the variables including the time-invariant one (i.e., distance) and the dummy variables (i.e., SAFTA and MFA). Along with panel least squares, the random effects (RE) model, and the fixed effects (FE) model under the panel data approach have also been tested. Table 4 compiles the results of the least square model.

Table 4: Gravity Estimation Results (Overall Regression with All the Variables)

Dependent Variable: Bilateral Exports (From country *i* to Country *j*) Data Range: 1992 to 2010 Method: Panel Least Squares		
Variable	**Coefficient**	**t-Statistic**
Exporter's GDP	1.272901	53.57534**
Importer's GDP	1.007276	32.32375**
Geographical distance	-1.463918	-28.46444**
Exporter's population	-0.065087	-2.953191**
Importer's population	-0.059108	-2.222230**
Exchange rate	-0.065820	-5.514582**
Importer's Import-GDP ratio	0.809060	16.78088**
Importer's applied MFN tariff rates	0.255187	4.012444**
Importer's total tariff to total import ratio	0.108095	4.216989**
SAFTA	0.026564	0.206387
MFA	1.215001	8.052321**
Constant	-25.20093	-32.89116**
R-squared	0.685216	
Adjusted R-squared	0.684365	
F-statistic	805.2097	

Note: 1. * and ** denote significant at 5% and 1% levels respectively.

Source: Author's calculations.

The impact of the common gravity variables is, as expected, statistically significant, and theoretically justified. Coefficients on the central variable of the gravity model, i.e., the GDP coefficients for the exporting and the importing countries, bear positive signs and are highly significant (1% level). Overall, it is apparent that the economic size of the trading partners plays an important role in the determination of trade flows. The estimation in this study also suggests that the increase in export flows is more than proportional as compared with the increases in the GDP of the trading partners: if the GDP of the exporting (importing) country increases by 1%, bilateral export volume would increase by 1.27% (1.01%). The coefficient estimate for the distance variable is negative, standing at around -1.46, indicating that when

the distance between the exporting and the importing partners increases by 1%, trade between them falls by about 1.46%. The coefficient values of the proxy to market sizes, i.e., population for both exporting and importing countries, are highly significant (1% level) and bear negative signs, indicating absorption effects.

Contrary to the hypothesis of this paper, the coefficient for exchange rates bears a rather low value (-0.066) and bears the opposite sign from what would be expected, suggesting that currency manipulation (for example, devaluation of domestic currency) is unlikely to provide any effective results in a country's exports. Proxies for openness to international trade show mixed results. The coefficient for import-GDP ratio is positive as expected and statistically significant, indicating that intra-regional trade among the SAFTA members will rise with increased openness. The coefficients for tariff-import ratio and applied tariff rates of the importing country are statistically significant but bear opposite signs from what would be expected.

The coefficient on MFA is positive, highly significant, and effective. It bears a value of around 1.22, underscoring its importance in trade flows from developing to developed countries. The MFA dummy here reflects the preferential access of the developing countries to the markets of the developed countries. Thanks to the quota system under the MFA regime, smaller economies such as Bangladesh got assured and predictable access to the textile and clothing markets in the developed countries (US and EU for example), without facing competition from larger developing economies such as the PRC and India. Other South Asian countries also managed to utilize the MFA preference. Recent trends, for example on Bangladesh's readymade garments exports, show that the abolition of the MFA regime has not been as detrimental to the smaller economies as was feared, but it could be because of the specialization and comparative advantages that Bangladesh (and other smaller economies) gained under the MFA, and also because of the PRC's rising labor costs, among others.

One major purpose of this paper is to assess whether a regional trading block in South Asia generates trade creation effects or not. The analysis of this study shows that the coefficient on the regional dummy, SAFTA, is positive (i.e., associated with trade creation), although the value of the coefficient is low and holds low statistical significance. Some of the earlier studies indicated a weak potential of SAFTA. Baysan et al. (2006), for example, argue that as the South Asian region is small (from an economic point of view) in relation to the rest of the world, and as the economies of the region maintain significantly high level of trade protection (in particular, rules of origin, tariff-rate quota and sector-specific exception), a regional FTA among the South Asian economies is more likely to be trade diverting than trade creating. However, the current study tends to agree with the findings of empirical studies conducted by Coulibaly (2004), and Rahman, Shadat, and Das (2006), which demonstrated the trade creation effects of SAFTA. The low statistical significance of the current study can be associated with weak relative trade relations among the South Asian economies as compared with extraregional partners. Indeed, South Asia's low level of intraregional trade is commonly referred to by pessimists. Although recent developments suggest   that the SAFTA members are trading more with each other than before in terms of absolute volume,[12] their intraregional trade share has continued to be significantly low (Figure 5). The periods covered in Coulibaly (2004) and Rahman, Shadat, and Das (2006) were up to 2000 and 2003, respectively, while this study's covered period is up to 2011. As Figure 5 shows, South Asia's intraregional trade share grew slowly but steadily from 1997 to 2005 (except in 1999 and 2004), and reached its peak (6.20%) in 2003. However, after 2005 the share started to fall again from year to year, and had dropped to 4.27% by 2011. It is therefore not surprising that the coefficient for the regional dummy in the current study has demonstrated low value as well as low statistical significance, although the value itself is positive. Nonetheless, based on the empirical results of this study as well as the previous

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[12] As shown in Table 2, intraregional trade in South Asia had increased from a meager $1.8 billion in 1990 to $20.3 billion by 2006 and to $40.5 billion by 2011.

ones discussed above, and the increasing trend in the overall volume of intraregional trade, this paper argues that there are reasons for being optimistic about SAFTA becoming a cohesive and profitable regional trading bloc.

This study also conducted random effects (RE) and fixed effects (FE) analyses to see how sensitive the results would be under these two models in comparison with the least squares method presented above. Table 5 presents the results for the panel data approach with the FE and RE.

Table 5: Results of the Fixed Effect and Random Effect Models

.Dependent Variable: Bilateral Exports (From Country *i* to Country *j*) Year: 1992 to 2010 Method: Random Effect and Fixed Effect		
Variable	**Random Effect Model**	**Fixed Effect Model**
Exporter's GDP	0.830463**	0.484674**
Importer's GDP	0.457109**	0.739097**
Geographical distance	-0.969083**	---
Exporter's population	0.305359**	1.205358**
Importer's population	0.324802**	-2.023917**
Exchange rate	-0.039999	-0.024838
Importer's import-GDP ratio	0.443108**	0.591145**
Importer's applied MFN tariff rates	-0.168169**	-0.342786**
Importer's total tariff to total import ratio	0.068869*	0.046055
SAFTA	-0.290857**	-0.198345
MFA	0.252626**	0.126851
C	-17.34368**	2.633375
R-squared	0.633949	0.937014
Notes: 1. * and ** denote significant at 5% and 1% levels respectively. 2. R-squared for the RE model is unweighted.		

Source: Author's calculations.

The RE and the FE models demonstrate relatively weak estimates for the GDP of the exporter and importer countries in comparison with the least squares results: the least squares results found that a 1% increase in either the importer's GDP or the exporter's GDP would increase bilateral trade more than 1% (Table 4), whereas both the RE and FE models suggest the increase to be less than 1% (Table 5). Furthermore, contrary to the least squares model, where the population variable bears negative signs (indicating absorption capacity) for both the importing and the exporting countries, the RE model's estimates bear positive signs, indicating economies of scale. In the FE model, exporter's population bears a positive sign whereas it is negative for importer's population.

The exchange rate variable in all the three models show similar low value and negative sign, but in the RE and FE models this coefficient is statistically insignificant. Import-GDP ratio in the RE and FE models are also similar to the least squares model estimates, although the impact is close to half of the least squares model in the RE model. Estimates on the importing country's tariff-import ratio also demonstrate similar, against-the-hypothesis results in all the models. However, the RE and FE models differ from the least squares for the estimates on the importing country's applied MFN tariff rates. This estimate contradicts the hypothesis of the study in the least squares model, but in the RE and FE models the signs

change to negative conforming to the theoretical justification of the negative impacts of tariff on trade flows. The MFA dummy bears a lower value in the RE and FE models than in the least squares, but the signs are the same in all the models. Estimates for the regional dummy, SAFTA, however, turns negative in the RE and FE, whereas it was positive but insignificant in the least square model.

The results of the least square regression using 2009 data including the Overall Trade Restrictiveness Index (OTRI) of the importing country are presented in Table 5.

Table 5: Regression Results (Least Square, Including the OTRI Variable)

Dependent Variable: Bilateral Exports (From Country *i* to Country *j*) Year: 2009 Method: Least Squares		
Variable	**Coefficient**	**t-Statistic**
Exporter's GDP	1.689733	15.042280**
Importer's GDP	1.299134	9.966253**
Geographical distance	-1.411029	-6.019851**
Exporter's population	-0.254978	-2.518277*
Importer's population	-0.141906	-1.146055
Exchange rate	-0.168591	-3.389755**
Importer's import-GDP ratio	1.229156	3.091347**
Importer's applied MFN tariff rates	0.027398	0.079861
Importer's total tariff to total import ratio	0.216675	2.400368*
Overall Trade Restrictiveness Index of the importing country	-0.452681	-1.449284
SAFTA	0.142232	0.264183
C	-39.35948	-11.520720**
R-squared	0.804733	
Adjusted R-squared	0.795631	
F-statistic	88.41813	
Notes: 1. * and ** denote significant at 5% and 1% levels respectively.		

Source: Author's calculations.

All the common gravity variables as well as the SAFTA dummy demonstrate a similar impact as the panel least square regression discussed previously. The coefficient for the OTRI variable, as expected, bears a negative sign, although its statistical significance is not high. Its value stands at around -0.45, suggesting that if the importing country's trade restrictiveness measured in OTRI increases by 1%, bilateral trade flows will decrease by 0.45%. The result suggests that reducing trade restrictiveness (i.e., tariff and non-tariff barriers) will increase trade flows among countries. South Asian economies, which typically maintain high trade restrictions, will benefit from improved regional and global integration by reducing these barriers.

6. CONCLUSION

There is a broad understanding among economists that trade openness—if pursued under the right conditions—promotes economic growth, and many countries have combined their involvement in the multilateral trading system with regional trading blocs. Contemporary global economic developments have indicated an increasing trend in the use of FTAs for fostering trade.

Compared to other regions such as East Asia, Latin America, and North America, South Asia has lagged behind in terms of regional integration. Skeptics have long been doubtful about the success of a regional economic grouping among the South Asian nations. However, the region's recent economic dynamism and shift toward outward-oriented policies have generated significant interest in the issue of South Asian economic integration. Institutional developments took place under the ambit of SAARC through SAPTA and then SAFTA. Several quantitative and qualitative studies—some of them discussed earlier in this paper—have been conducted on SAPTA/SAFTA's potential gains, but the findings have largely remained inconclusive.

This paper has attempted to examine the determinants of trade flows and the effects of the SAFTA regime. A review of the economy and trade of the South Asian economies set the context of the analysis, was followed by a discussion on the available options for empirical methods used in international trade studies and the reason behind choosing the specific method used in this study. The paper also reviewed several relevant studies on SAFTA to highlight the debates on the regional bloc's potential.

The empirical part of the paper developed an estimation of the gravity model for analyzing the implications of SAFTA. The regression with country-pair panel data took into account the typical gravity variables as well as additional explanatory and dummy variables that were found to be relevant for investigating the effects of FTAs on trade flows.

Size of the economies of both the exporting and the importing countries appeared to be an important determinant of trade flows. The relationship between the trading partners' GDP and export flows was found to be more than proportional. This phenomenon, coupled with the impressive performance of South Asian economies in recent years, may lead the countries of this region to further enhance their trade flows. Population and physical distance between the trading partners were also found to be relevant. While exchange rates showed only limited effects on trade flows, findings on import-GDP ratio indicated that it is an important determinant for bilateral trade and that intra-regional trade among the SAFTA members will rise with increased openness. Moreover, the additional regression with overall trade restrictiveness indices suggest that scaling down tariff and nontariff barriers will positively affect intra-bloc trade among the South Asian economies. This calls for an effective implementation of SAFTA's trade liberalization program.

The dummy variables demonstrated predicted results. An MFA-like preferential regime, because of its inherent assurance and predictability, may help smaller economies to gain access in the developed country markets.

The critical finding of this study in all regressions, which differs from some earlier works, is related to SAFTA's potential for generating intra-regional trade creation. This paper argues that there are reasons for being optimistic about SAFTA becoming a cohesive and profitable regional trading bloc. The results of this study, however, are based on trade in goods, which is at the center of the SAFTA regime. The recently-signed services agreement (SAARC Agreement on Trade in Services, signed in 2010), is yet to be implemented. To reap the benefits of economic integration, South Asia needs to promote liberalization in the services area, which is one of the most promising areas for a rising South Asia. Additionally, an intra-SAARC investment agreement is likely to create an enabling environment for cooperation

beyond mere trade to include investment and finance among others (SACEPS 2002, Raihan 2012).

It is only through maintaining the primacy of economic integration that the countries of the region can expect effective cooperation in South Asia. Regional economic integration will eventually facilitate the achievement of South Asia's overriding goals of poverty reduction and social and human development. South Asian economies must conceptualize integration as an evolving process. SAARC has an explicit intent to move in the direction of an economic union. Recent success in the growth performance of the South Asian countries offers both prospects and challenges for deeper integration with the global economy. Integration under the SAFTA is the first step in that direction. Further work is needed on the determinants and trade effects of South Asian integration to overcome limitations in the present empirical study.

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