What Does Gravity Model Reveal About SAFTA?

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During last decade, the stalemate in multilateral trade negotiations under the framework of World Trade Organization (WTO) regime has provided impetus to the signing of regional trade agreements world over .South Asia is not an exception to this trend and has been involved in setting up its own bilateral and Regional Trade Agreements (RTAs). Most commonly cited cooperation agreements are *Agreement on Trade and Commerce between India and Bhutan(1972), India-Nepal Bilateral Trade and Transit Treaties(1991), India–Sri Lanka Bilateral Free Trade Area(1998)* Bangkok Agreement (1975), Bangladesh, India, Myanmar, Sri Lanka, Thailand Economic Cooperation (BIMST-EC-2004) and the Indian Ocean Rim Association of Regional Cooperation (IOR-ARC-1997). One of the most significant steps towards regional economic cooperation in the history of South Asian countries, was taken with signing of The South Asian Association for Regional Cooperation (SAARC) formed in 1985 with the objective of exploiting "accelerated economic growth, social progress and cultural development in the region" for the welfare of the peoples of South Asia (SAARC Secretariat, 2006a). And then seven South Asian countries—Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka—initiated a framework for region-wide integration under the South Asian Preferential Trade Agreement (SAPTA) in 1995. In order to further cement the regional economic relations and overcome some impediments of SAPTA, the South Asia Free Trade Agreement (SAFTA) was signed in early 2004, which came into force on 1st July 2006. The SAFTA is a parallel initiative to the multilateral trade liberalization commitments of

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the South Asian Association for Regional Cooperation (SAARC) member countries. SAFTA aims to reduce tariffs for intraregional trade among the seven SAARC member countries. It has been agreed that for the South Asian countries, Pakistan and India will eliminate all tariffs by 2012, Sri Lanka by 2013 and Bangladesh, Bhutan, Maldives and Nepal by 2015.

There have been some strong arguments for the regional economic integration in South Asia, as this integration is thought to generate significant intraregional trade and welfare gains for the South Asian countries. However, critics have pointed out that the potential benefits from the SAFTA and other regional trading arrangements in South Asia are little because there are limited complementarities in the region; major trading partners of the individual South Asian countries are located in the west etc. It is also alleged that an Regional Trade Agreement (RTA) in South Asia will lead to substantial trade diversion than trade creation and it may work as a stumbling bloc to multilateral trade liberalization. Given these aforementioned arguments and counter-arguments it is therefore imperative to examine the impacts of the SAFTA and cooperation among the South Asian countries for greater trade policy coordination.

Literature available on the theory of RTAs mainly deals with two important questions: what are the impacts of RTAs on member countries? And what are their impacts on the world trading system as a whole? However, many researchers find these theoretical models ambiguous in determining whether RTAs are net trade-creating or net trade-diverting; and whether they are "building blocs" or "stumbling blocs" to multilateral trade liberalisation. Bhagwati and Panagariya (1996) and Panagariya (1996, 1998) argued that RTAs are likely to reduce welfare in member countries and impede multilateral trade liberalisation (Robinson and Thierfelder 1999). Others have argued that, "it is essentially an empirical issue that must be settled by analysis of data" (Lewis et al. 2001). Such views have led to the increasing importance of quantitative evaluations of RTAs to provide insight into the effects of RTAs. Many approaches are available to peep into these issues but one of the most conventional and widely used is gravity approach. This technique has not only been heavily used by the researchers in assessing potential of trade under RTAs world over but also in South Asia as well, in that SAFTA is also heavily researched. The current paper is also a similar attempt in assessing the potential trade in the region with latest dataset. This paper consists of four sections. Following the introductory section, Section 2 provides an overview of the economic structure and intra-regional trade in South Asia. Gravity model approach and related literature is reviewed in section 3.

The section 4 analyzes the results of the gravity and lastly, conclusion and recommendations are presented in the last section.

Section II

The relative size of South Asian economies in world GDP and trade are reported in Table 1. In 2001, the region as a whole accounted for just 2% of world GDP, and about 1.3% of world imports and world exports. As the largest nation in the region, India accounts for over three-fourth of the GDP of the region, and about two-thirds of the region's trade. The relative insignificance of the region as a whole in world trade is largely due to the historically autarchic policies followed by the countries of the region, especially by India, that accorded a very low importance to international trade. Although all the countries of this region have embarked upon trade liberalization effort especially during the 1980s and 1990s, dependence on international trade is still not very high for most of these countries (except Sri Lanka) as reflected in the low ratios of exports and imports to GDP.

A possible reason for the relatively low dependence of these economies on international trade is the high import tariffs that remain in South Asia even after the attempts at liberalization. Appendix A Tables 1 to 4, reports the bilateral import tariff rates in the year 2001 of the four South Asian countries. India retains high tariffs on agriculture, textile, manufacturing sector with the tariff rates ranging between 12 to 95 per cent. India has relatively higher tariffs than any other South Asian country. Though Bangladesh, Sri Lanka and Rest of South Asia are less protective compared to India, their tariff rates in some sectors are at par with India. In all the South Asian countries the highest tariff rates are in general applied on imports from non-South Asian trading partners.

Table 1: South Asia in the World

	Share in the World			Trade Dependence Ratio	
	GDP %	Exports %	Import %	Export/GDP	Import/GDP
Bangladesh	0.15	0.11	0.14	0.17	0.22
India	1.53	0.89	0.87	0.13	0.13
Sri Lanka	0.05	0.09	0.09	0.41	0.42
Rest of South Asia	0.27	0.21	0.21	0.17	0.18

(Source: IGIDR WP-2007-017)

Turning to the trade patterns, all the South Asian countries trade more with non-South Asian countries than amongst themselves (Table 2). In general China, Japan, REA, ASEAN, NAFTA, EU27, and MENA are the major trading partners for most of the South Asian countries. Two features stand out of the little intra-regional trade that takes place in South Asia. First, the intra-regional trade for Bangladesh, Sri Lanka and Rest of South Asia is primarily India centric, with very little trade taking place amongst each other. Second, while India is an important source of imports and market for exports to these three countries, none of them is a major trade partner for India.

Compared to the high level of intra-regional trade in other regions in the world, the low level of South Asian intra-regional trade is not an encouraging sign for the regional integration. The estimate shows that South Asia has the lowest intra-regional exports share in the world. The situation of total South Asian intra-regional trade is also not much different and the data reflects the same pattern. While the share of intra-regional trade in South Asia's total trade has declined from 3.5 per cent to 2.4 between 1970 and 1990, it has shown moderate rise from 2.4 per cent in 1990 to 4.6 in 1999 (as per Direction of Trade Statistics of IMF). But still, intra-regional trade as share of GDP in South Asia, as clear from the table 3, is the lowest as compared with other regions around the world such as East Asia and Pacific, Europe and Central Asia etc. The other important trend is India's growing trade surplus with other SAARC countries. India is the biggest country in the region and its exports to other SAARC countries (except Pakistan) have continuously increased. While the share of India's exports to the region in its total exports has increased from 3.9 per cent in 1970 to 5.5 per cent in 1999, its import share from the region has declined from 1.4 per cent to 0.9 per cent during the same period.

Table 2: South Asian Countries Trade Share

	Import Share from World					Export Share to World			
Import source	BGD	IND	LKA	RSA	Export destination	BGD	IND	LKA	RSA
1 ANZ	0.028	0.027	0.04	0.026	1 ANZ	0.005	0.012	0.012	0.013
2 CHN	0.121	0.044	0.061	0.062	2 CHN	0.002	0.034	0.007	0.042
3 JPN	0.062	0.042	0.05	0.055	3 JPN	0.019	0.048	0.048	0.035
4 REA	0.148	0.053	0.144	0.058	4 REA	0.022	0.049	0.02	0.052
5 ASEAN	0.173	0.14	0.186	0.115	5 ASEAN	0.025	0.076	0.025	0.035

6 BGD	0	0.001	0.001	0.004	6 BGD	0	0.019	0.002	0.011
7 IND	0.121	0	0.097	0.04	7 IND	0.008	0	0.011	0.041
8 LKA	0.001	0.001	0	0.008	8 LKA	0.001	0.01	0	0.009
9 RSA	0.017	0.01	0.021	0.013	9 RSA	0.006	0.009	0.017	0.013
10 NAFTA	0.068	0.134	0.077	0.097	10 NAFTA	0.397	0.225	0.402	0.28
11 RAMR	0.042	0.085	0.013	0.014	11 RAMR	0.01	0.031	0.02	0.025
12 EU27	0.122	0.272	0.196	0.207	12 EU27	0.444	0.299	0.318	0.282
13 REUR	0.032	0.036	0.026	0.039	13 REUR	0.018	0.043	0.042	0.031
14 MENA	0.053	0.112	0.08	0.238	14 MENA	0.036	0.101	0.069	0.104
15 SSA	0.01	0.04	0.006	0.023	15 SSA	0.007	0.044	0.007	0.027
Total (US $ millions)	10306	62295	6726	15228	Total (US $ millions)	7921	61126	6528	14388

(Source: IGIDR WP-2007-017)

Table 3 Intra-Regional Trade of World Regions as Share of GDP (2004)

S. No.	Region	Intra-Regional Trade
1	East Asia and Pacific	26.5
2	Europe and Central Asia	15.3
3	Latin America	6.4
4	Sub-Saharan Africa	5.3
5	Middle East and North Africa	3.5
6	South Asia	0.8

Source: World Bank. Global Economic Prospects 2005, Washington DC. p. 43.

Table No 4 reveals the status of intra-regional trade among SAARC countries . The data reveal that SAARC countries' trade within the region is very low . As far as the exports of the SAARC countries are concerned they were just 4.48 per cent of their total exports in 1985 and after a long period of almost twenty years they increased marginally to 5.34 per cent in 2004. On the other hand their exports to the other countries of the region and rest of the world were as high as 29.75 per cent and 95.53 per cent of their total exports in 1985 and in 2004 this percentage increased to 36.56 and 94.66 per cent respectively.

In terms of the imports of these countries situation is little bit better. Their intra regional imports were 1.91 per cent of their total imports in 1985 which increased to 3.87 per cent in 2004. The share of the SAARC countries' imports from the rest of the region and from rest of the world has declined slightly. For example the share of imports from rest of the region and rest of the world in their total imports was 42.26 and 98.090in 1985 decreased slightly to 39.52 and 96.13 respectively in 2004. Still this share is too high in comparison to intra regional imports. With this background, this paper utilizes **Augmented Standard Gravity Model** to predict the level of trade potential under SAFTA.

The Gravity Model Approach & Literature Review

The gravity equation is a simple empirical model for analyzing bilateral trade flows between geographical entities. The gravity model for trade is analogous to the Newtonian physics function that describes the force of gravity. The gravity model for international trade is based on the idea that trade between countries, like gravitational force, is a function of mass (GDP, population) as well as distance. In its basic form the gravity model assumes that trade between two countries is directly related to their size (usually appraised by their GDPs) and inversely related to the geographical distance between them. Gravity model hypothesizes that, in general, countries' income, size, and proximity determine the scope for bilateral trade flows. Such a model also assumes that these latter are further shaped by other systematic factors that can be identified (common culture, trade policies, presence of conflict) and by idiosyncratic forces that are customarily controlled for by using year and countries' fixed effects. The coefficients on each of these variables allow one to estimate how two partners will trade with each other if they behave like "normal" countries.

Section III

Numerous studies have shown that gravity type model is one of the most appropriate ways to model international trade flows (Baldwin 1994, Eichengreen & Irwin 1998, and Feenstra 1998). Tinbergen (1962) and Poyhonen (1963) have independently developed simple gravity model of trade and numerous adjustments and additions have subsequently been made to the standard gravity model. Regional dummies are used in gravity equations to isolate influence of regional agreements on trade flows which otherwise would have been soaked up in gravity variables. In recent years, gravity models have been used in empirical studies, of changes in international trade pattern and integration of economies. It provides a useful multivariate framework, for assessing the impact of preferential trading arrangement, and the level and direction of international trade. The extended models incorporate regional

integration, trade barriers, prices, etc also in this framework. It offers systematic framework for measuring the patterns of bilateral as well as regional trade throughout the world and can be easily amenable to the analysis of regional influence in international trade (Frankel, Stein and Wei, 1995).

Table 4 Trend in SAARC Countries Trade Share 1985-2004

	Exports					Imports			
	Intra-trade of group	**Rest of the region**	**Rest of the world**	**Total trade of SAARC**		**Intra-trade of group**	**Rest of the region**	**Rest of the world**	**Total trade of SAARC**
YEAR	%	%	%	US$ millions	YEAR	%	%	%	US$ millions
1985	4.48	29.75	95.53	13425	1985	1.91	42.26	98.09	26941
1986	3.76	28.58	96.24	14729	1986	2.04	39.93	97.96	25191
1987	3.50	28.24	96.50	17555	1987	1.90	40.38	98.10	28008
1988	3.80	28.32	96.20	20721	1988	2.13	39.25	97.88	31592
1989	3.66	31.18	96.34	23572	1989	1.66	40.43	98.34	32682
1990	3.17	26.12	96.83	27229	1990	1.97	41.60	98.03	38391
1991	3.57	30.85	96.43	28353	1991	2.56	39.67	97.44	35085
1992	3.91	29.03	96.09	31697	1992	3.09	42.28	96.91	40441
1993	3.59	31.43	96.41	33229	1993	3.20	45.09	96.80	39515
1994	3.80	31.30	96.21	37776	1994	3.41	46.98	96.59	44042
1995	4.42	30.87	95.59	45832	1995	3.86	45.22	96.14	58045
1996	4.34	32.34	95.66	49429	1996	4.53	46.41	95.47	61528
1997	4.18	30.62	95.82	51976	1997	3.74	45.90	96.26	66641
1998	4.81	27.96	95.19	51255	1998	4.62	44.55	95.38	66890
1999	4.03	28.67	95.97	54140	1999	3.53	46.48	96.47	74406
2000	4.10	29.09	95.90	63295	2000	3.48	39.93	96.53	78193
2001	4.31	30.06	95.69	65598	2001	3.62	41.29	96.38	85158
2002	4.19	30.71	95.81	71490	2002	3.52	40.37	96.48	92957

2003	5.63	34.94	94.37	84767	2003	4.42	39.09	95.58	101084
2004	5.34	36.56	94.66	110885	2004	3.87	39.52	96.13	145618

Source: UNCTAD Handbook of Statistics On-line,http://www.unctad.org/Templates/Page.asp?intItemID=1890&lang=1

Among the many studies using the gravity framework, a high percentage shares the research task of predicting trade potentials. Rahman (2003) has estimated trade potential for Bangladesh using panel data approach with economic factors like openness, exchange rates etc rather than natural factors. Christie (2002) estimates trade potential for Southeast Europe using ordinary least square estimation on cross section data from 1996-99. Kalbasi (2001) has analyzed the volume and direction of trade for Iran in a 76 country sample. In that study, the group of countries has been divided into developing and industrial countries and trade flows have been examined to determine the impact, if any, of the stage of development on bilateral trade.

Several studies have analyzed the trade enhancing impact of preferential trading arrangements. These studies predict the additional bilateral trade that would be a consequence of the economic integration of a set of economies. Both the cross section and panel data approach has been used by these studies. The cross-section and also the panel data approach is mainly static and refers to a long run relationship. Frankel (1997) has used the gravity model to investigate a host of issues like the estimates of trading blocs, role of currency links etc using cross-section and panel data. Frankel and Wei (1993) have examined bilateral trade patterns throughout the world and analyzed the impact of currency blocs and exchange rate stability on trade. In the recent studies that employ the gravity model include Srinivasan and Canonero (1995) and Sengupta and Banik (1997). Both studies predict, by using gravity model, that the impact of a South Asian FTA on trade flows will be small for India but much larger on the smaller countries. Sengupta and Banik predict a 30 percent increase in the official intra-SAARC trade and as much as 60 percent if illegal trade, which is currently out of the official count, becomes a part of official trade.

As regards the estimated trade creation and diversion effect of SAPTA, the empirical literature could not reach any consensus. Coulibaly (2004) found net export creation and Tumbarello (2007) and Hirantha (2004) found net trade creation for SAPTA. On the other hand, Hassan (2001) found net trade diversion for SAPTA while Rahman (2003) found SAARC dummy variable to be insignificant. However, all these studies differed in methodological aspects and data coverage. Tumbarello (2007) and Hirantha (2004) applied both panel and cross-section techniques, but they did not

consider the country pair specific fixed effects in estimating panel regression model. The data coverage for Tumbarello (2007) was 1984-2003 (for panel) and 1996, 1999, 2002 and 2003 (for cross-section study of SAPTA) while Hirantha's (2004) study used data covering 1996-2002 (for panel data) and 1996, 1999 and 2002 (for cross section data). Hassan (2001) estimated gravity model using cross section data (for 1996 and 1997). Rahman (2003) estimated Bangladesh's trade potential using panel techniques with country pair specific fixed effects where data covered the period 1972-1999.

Estimation Method and Results

This section contains the methodology to analyze the gravity model of bilateral trade flows between the trading partners of the SAARC countries. One of the crucial factors of the gravity model is the distance between two countries, which is a time invariant variable. To capture the effect of distance we postulate the following model.

$$\boldsymbol{lntrade_{it} = \beta lnpgdp_{it} + \Sigma \lambda_i D_i + \varepsilon_{it}}$$

We have data on trade for thirty six different pairs of countries and we are considering one pair of countries as a single group[3]. D_i is a variable that takes a value equal to the distance between countries which belong to i-th group; otherwise it takes a zero value. For example D_1 is equal to distance between Bangladesh and India whenever we are considering the trade volume of these countries other wise it is equal to zero. We estimate our model by applying least square technique.

Appendix 2 contains the estimated coefficients (with t-values) of all the independent variables.

- Coefficient of ***lnpgdp*** is equal to .847 with a significant t-value.
- The coefficient of ***lnpgdp*** which is less than one; implies trade volume depend positively but less than proportionately on the per capita GDP of associated countries
- Distance coefficients have negative sign, supporting the theory of gravity model. The coefficients of distance are statistically insignificant at 5% level of significance. In case of some neighboring countries like India/Bangladesh, India/Nepal, India/Srilanka and India/Pakistan. In these cases distance does not affect trade. However, in other cases like Pakistan/Nepal,

[3] A complete description of all the thirty six different groups is given in Appendix 1.

Pakistan/Srilanka etc which are farther apart distance does play a significant role.

Section IV

Limitation of Gravity Model

As none of the methodologies is free from limitation and the results of every study have always been questioned based on methodological grounds. Some most commonly cited limitations of gravity model have been discussed here. In the gravity model, the choice of independent variables: GDP at current prices versus purchasing power parity adjusted GDP, and that of independent variables: choosing imports or exports versus total trade (exports plus imports) in gravity models has been heavily debated in the literature (Kandogan, 2004). Similarly, using pooled data to estimate regressions, although it increases the No of degree of freedom available, has also been questioned as it imposes a common gravity relationship on all reporting countries. Since this is likely to bias the results, many researchers allow individual countries to deviate from average gravity relationship by controlling country-specific effect by adopting fixed and random effects panel data techniques. The possibility of heteroscedasticity can be controlled by using robust standard errors (Greenway, 2000).

When comparing different regions, for example, the intra-regional trade share may give misleading information, because its value is biased by the number of countries in each region and by their dimensions. Given the size of a region, as measured by its total trade, the higher the number of countries in that region, the larger its intra-regional trade share will be. In other words, splitting a region into an increasing number of countries raises its intra-regional trade share by transforming domestic exchange into international (intraregional) trade. Moreover, other things being equal, a region with a high number of member countries will show a larger intra-regional trade share than a region of the same total trade size, but with a smaller number of members.

Section VI

Conclusion

Gravity model used here, explains bilateral trade flows of South Asian Countries (SACs) in case of panel data . However, there are few instances where the coefficients are not as desired in the standard gravity model. But by and large, analysis shows strong evidence of trade creation in the region under SAPTA. This supports the

proposition that further regional integration may bring about substantial benefits to SAARC region and South Asian Free Trade Area may promote intra-regional trade through further dismantling of tariff and other non-tariff barriers to trade among members. However most South Asian countries rely heavily on countries outside the region for most of their imports requirements as these commodities are not being manufactured in the members of the region. Therefore an increase in the intra regional trade will also accompanied by an increase in trade with non member countries As a result, increased intra-regional trade is sustained by increased trade with non-members. However, intra regional trade between SAARC countries can be further promoted with positive spill over effect on trade with non-members, if serious efforts are made to expedite necessary structural adjustments in member states and inefficiencies in the economic system are addressed without delays. The role of distance is also very important in determining the volume of intra regional share for SAPTA countries. On the basis of the present analysis it can be concluded that the countries which share a common border, have a higher volume of bilateral trade and voice versa.

Appendix 1

In the present analysis, we have panel data consisting of seven annual observations on thirty six individual units. The seven observations relate to years 1999 to 2005 and individual units are groups of trading partners of the SAARC group as follows. :

Trading Partners of the SAARC group

GroupNo	cou_i	cou_j
1	bangladesh	india
2	bangladesh	maldives
3	bangladesh	nepal
4	bangladesh	pakistan
5	bangladesh	srilanka
6	bangladesh	bhutan
7	india	bangladesh
8	india	maldives
9	india	nepal
10	india	pakistan
11	india	srilanka
12	india	bhutan
13	maldives	bangladesh

14	maldives	india
15	maldives	nepal
16	maldives	pakistan
17	maldives	srilanka
18	maldives	bhutan
19	nepal	bangladesh
20	nepal	india
21	nepal	maldives
22	nepal	pakistan
23	nepal	srilanka
24	nepal	bhutan
25	pakistan	bangladesh
26	pakistan	india
27	pakistan	maldives
28	pakistan	nepal
29	pakistan	srilanka
30	pakistan	bhutan
31	srilanka	bangladesh
32	srilanka	india
33	srilanka	maldives
34	srilanka	nepal
35	srilanka	pakistan
36	srilanka	bhutan

NB: Trade data from Bhutan to other SAARC countries are not available.

Appendix 2: Estimation Result[4]

Intrade	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
lnpgdp	0.847	0.208	4.060	0.000	0.436	1.258
D1	-0.002	0.002	-1.200	0.231	-0.006	0.001
D2	-0.004	0.001	-4.090	0.000	-0.006	-0.002
D3	-0.011	0.004	-3.190	0.002	-0.019	-0.004

[4] Computed value of R-square is .969.

D4	-0.002	0.001	-2.140	0.033	-0.004	0.000
D5	-0.004	0.001	-3.070	0.002	-0.006	-0.001
D6	-0.020	0.006	-3.310	0.001	-0.032	-0.008
D7	-0.002	0.002	-1.230	0.219	-0.006	0.001
D8	-0.001	0.000	-2.880	0.004	-0.001	0.000
D9	-0.001	0.001	-1.440	0.150	-0.002	0.000
D10	-0.001	0.000	-1.840	0.067	-0.002	0.000
D11	-0.001	0.001	-1.520	0.130	-0.003	0.000
D12	-0.006	0.002	-2.540	0.012	-0.010	-0.001
D13	-0.031	0.007	-4.730	0.000	-0.045	-0.018
D14	-0.001	0.000	-2.710	0.007	-0.001	0.000
D15	-0.002	0.001	-4.710	0.000	-0.004	-0.001
D16	-0.003	0.001	-3.850	0.000	-0.004	-0.001
D17	-0.001	0.000	-2.660	0.008	-0.002	0.000
D18	-0.004	0.001	-4.040	0.000	-0.006	-0.002
D19	-0.012	0.004	-3.190	0.002	-0.019	-0.004
D20	-0.001	0.001	-1.440	0.152	-0.002	0.000
D21	-0.002	0.001	-4.510	0.000	-0.003	-0.001
D22	-0.005	0.001	-3.410	0.001	-0.007	-0.002
D23	-0.005	0.001	-4.100	0.000	-0.007	-0.002
D24	-0.024	0.006	-4.040	0.000	-0.035	-0.012
D25	-0.002	0.001	-2.000	0.046	-0.004	0.000
D26	-0.001	0.000	-1.830	0.069	-0.002	0.000
D27	-0.003	0.001	-3.780	0.000	-0.004	-0.001
D28	-0.005	0.001	-3.400	0.001	-0.007	-0.002
D29	-0.003	0.001	-2.270	0.025	-0.005	0.000
D30	-0.005	0.001	-4.030	0.000	-0.007	-0.002
D31	-0.004	0.001	-2.990	0.003	-0.006	-0.001
D32	-0.001	0.001	-1.510	0.134	-0.003	0.000
D33	-0.001	0.000	-2.620	0.010	-0.002	0.000
D34	-0.005	0.001	-4.130	0.000	-0.007	-0.002
D35	-0.003	0.001	-2.320	0.021	-0.005	0.000
D36	-0.005	0.001	-4.040	0.000	-0.007	-0.002

Appendix 3: Region Aggregation

No.	Code	Region description	Comprising
1	ANZ	Australia New Zealand Oceania	Australia; New Zealand; Rest of Oceania
2	CHN	CHN - China	China
3	JPN	Japan	Japan
4	REA	Rest of East Asia	Hong Kong; Korea; Taiwan; Rest of East Asia
5	ASEAN	ASEAN	Indonesia; Malaysia; Philippines; Singapore; Thailand; Vietnam; Rest of Southeast Asia
6	BGD	Bangladesh	Bangladesh
7	IND	India	India
8	LKA	Sri Lanka	Sri Lanka
9	RSA	Rest of South Asia	Rest of South Asia
10	NAFTA	North American Free Trade Area	Canada; United States; Mexico
11	RAMR	Rest of Americas	Rest of North America; Colombia; Peru; Venezuela; Rest of Andean Pact; Argentina; Brazil; Chile; Uruguay; Rest of South America; Central America; Rest of FTAA; Rest of the Caribbean
12	EU27	European Union 27	Austria; Belgium; Denmark; Finland; France; Germany; United Kingdom; Greece; Ireland; Italy; Luxembourg; Netherlands; Portugal; Spain; Sweden; Cyprus; Czech Republic; Hungary; Malta; Poland; Romania; Slovakia; Slovenia; Estonia; Latvia; Lithuania
13	REUR	Rest of Europe	Switzerland; Rest of EFTA; Rest of Europe; Albania; Bulgaria; Croatia; Russian Federation; Rest of Former Soviet Union; Turkey
14	MENA	Middle East North Africa	Rest of Middle East; Morocco; Tunisia; Rest of North Africa
15	SSA	Sub Saharan Africa	Botswana; South Africa; Rest of South African CU; Malawi; Mozambique; Tanzania; Zambia; Zimbabwe; Rest of SADC; Madagascar; Uganda; Rest of Sub-Saharan Africa
16.	Adean	Adean Community	Bolivia, Colombia, Ecuador, Peru
17.	Mercosur		Brazil, Argentina, Uruguay, Paraguay, Bolivia, Chile, Colombia, Ecuador and Peru, Venezuela
18.	ECOWAS	The Economic Community Of West African States	The Republic of Benin, Burkina Faso, Cabo Verde, Cote D' Ivoire, Gambia, Ghana, Guinee, Guinee Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togolese.

No.	Code	Region description	Comprising
19.	SADC	South African Development Community	Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, Zimbabwe, Namibia, South Africa, Mauritius , Democratic Republic of Congo, Madagascar , Seychelles

Appendix 4 : Commodity Aggregation

No.	Code	Commodity description	Comprising
1	CRLS	Cereals	Paddy rice; Wheat; Cereal grains nec
2	OCRPS	Other crops	Vegetables, fruit, nuts; Oil seeds; Sugar cane, sugar beet; Plant-based fibres; Crops nec
3	ANML	Animal products incl fishing	Cattle, sheep, goats, horses; Animal products nec; Raw milk; Wool, silk-worm cocoons; Fishing
4	NRES	Natural Resources	Forestry; Coal; Oil; Gas; Minerals nec
5	AGPR	Agro processing	Meat: cattle, sheep, goats, horse; Meat products nec; Vegetable oils and fats; Dairy products; Processed rice; Sugar; Food products nec; Beverages and tobacco products
6	TXTL	Textiles and garments	Textiles; Wearing apparel
7	PETR	Petroleum and coal products	Petroleum, coal products
8	OMNF	Other manufactures	Paper products, publishing; Leather products; Wood products; Chemical, rubber, plastic prods; Mineral products nec; Ferrous metals; Metals nec; Metal products; Motor vehicles and parts; Transport equipment nec; Electronic equipment; Machinery and equipment nec; Manufactures nec
9	CNSTRN	Construction	Construction
10	MRGNS	Margin services	Trade; Transport nec; Sea transport; Air transport; Communication
11	OSRVS	Other services	Electricity; Gas manufacture, distribution; Water; Financial services nec; Insurance; Business services nec; Recreation and other services; PubAdmin/Defence/Health/Educat; Dwellings

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