BIISS JOURNAL, VOL. 31, NO. 1, JANUARY 2010: 82-100

Mahfuz Kabir

ON THE INTEGRATION OF SOUTH ASIA

Abstract

South Asian leaders have undertaken the scheme of regional integration through the formation of South Asian Association for Regional Cooperation (SAARC) two and a half decades back. Afterwards, they have undertaken a number of measures to strengthen cooperation in economic and trade arena, *viz.*, SAARC Preferential Trading Arrangement (SAPTA) in 1995 and South Asian Free Trade Area (SAFTA) in 2006 as well as a host of confidence building measures. Have all these economic and non-economic measures led to integration amongst the members of the bloc? This study explores this important policy question by adopting time series econometric techniques. The results indicate that the important economic variables have long run or equilibrium relationship over the period 1985-2008, which imply a strong tendency of financial integration with a weak tendency of economic integration in the region.

1. INTRODUCTION

Recent upsurge of regionalism indicates a move towards continent-based arrangements with a focus on economic and trade cooperation amongst member countries of regional groups. The growth of regional economic cooperation arrangement is one of the major developments in the world political economy after the Second World War and particularly after the end of the Cold War. The formation of regional bloc has been greatly successful in bringing even historically hostile countries together. The factors that push countries closer are both economic and political but economic factors have always prevailed over the political. For example, in Europe and Southeast Asia, economic dimension have brought long time rivals in the same platform.

The term 'economic integration' encompasses broad areas of socio-political, economic and cultural links with countries joining together in a forum that generally belong to one or several regions.[1] It, in general, refers to a process of

Mr. Mahfuz Kabir is a Research Fellow, Bangladesh Institute of International and Strategic Studies (BIISS), Dhaka. His e-mail address is: mahfuz@biiss.org

removing gradually the discriminations which occur at borders. Such discriminations may affect the flow of goods and services, and the movement of factors of production either directly or through economic activity *via* the factors of production. The theories of economic integration have predicted two opposite outcomes. In the short run, trade creation effects must outweigh trade diversion effects in order to derive benefits of trade liberalisation.[2] However, there are also the long run benefits, such as greater technical efficiency due to greater competition, larger markets, higher consumer welfare gains and more foreign investment. The five main stages of regional integration are: free trade area (FTA), customs union, common market, economic union and total economic integration.[3] The Association of South East Asian Nations (ASEAN), European Union (EU) and North American Free Trade Area (NAFTA) are some of the prominent examples of such integration. The depth of economic integration ranges from preferential trading arrangement (PTA) to FTA, customs union (CU), common market (CM) and economic union (EU).

South Asian Association for Regional Cooperation (SAARC) was established in 1985 with high hopes of uplifting lives of the population who consist of half of the worlds poor.[4] The charter and agenda of SAARC suggest that it is an outcome of serious effort and great vision aiming "to promote the welfare of people of South Asia and to improve their quality of life; … to promote active collaboration and mutual assistance in economic, social, cultural, technical and economic fields."[5] Soon after inception with the objective of greater economic cooperation, the SAARC Preferential Trading Arrangement (SAPTA) was formed in order to promote regional economic cooperation, which came into operation in 1995. Later on, a series of negotiation took place, which resulted in the South Asian Free Trade Area (SAFTA) in 2006.

Now a key policy question is: has SAARC been able to facilitate economic integration in South Asia? Traditionally, economic integration refers to the importance of intra-regional trade as mentioned before. Thus, the overwhelming studies are concentrated on the issues of trade and welfare effects of regional

---

[1] Moazzen Hussain, Iyanlur Islam, and Reza Kibra, *South Asian Economic Development: Transformation Opportunities and Challenges*, London/New York: Routledge, 1999, p.145.

[2] Jose L. Tongzon, "The Challenges of Regional Economic Integration: The Vietnamese Perspective", *Developing Economics*, 37, 1999, p.142.

[3] E. Dorrucci, S. Firpo, M. Fratzscher, and F.P. Mongelli, 2002, "European Integration: What Lesson for Other Regions: A Case of Latin America", *Working Paper 185*, Frankfurt: European Central Bank, 2002.

[4] Atiur Rahman, "SAARC: Not yet a community", in Jim Rolfe (ed), *The Asia-Pacific: A Region in Transition*, Honolulu: Asia-Pacific Center for Security Studies, 2004, pp.133-148.

[5] S.M. Khan and Z.S. Khan, "Asian economic integration: A perspective on South Asia", *Journal of Asian Economics*, 13, pp.767-785.

integration schemes. However, recent literature suggests that the degree of economic integration can be more meaningfully perceived in terms of the long-term or 'equilibrium' relationship of key economic variables amongst a group of countries.[6]

The present paper examines the state of integration amongst South Asian countries by assessing the long-term relationship of their key economic variables. The paper is organised in four sections. While the ongoing Introduction constitutes the Section 1 of the paper, Section 2 presents the state of intra-regional trade. Detailed methodology of the study is explained in Section 3, while the results and interpretations are presented in Section 4. Finally, concluding remarks have been made in Section 5.

2. Trade Integration in South Asia: Current Status

A large body of theoretical and empirical literature has investigated the role of regional economic integration. The Customs Union theory predicts that customs union schemes can promote new trade among members, but they can also divert trade from more efficient producers outside the union. More specifically, regional integration can result in trade creation by allowing low-cost foreign producers freer access to the domestic market, reducing domestic prices, and displacing higher-cost domestic producers. However, it can also result in trade diversion by allowing less efficient producers that are members to displace more efficient producers from the rest of the world.

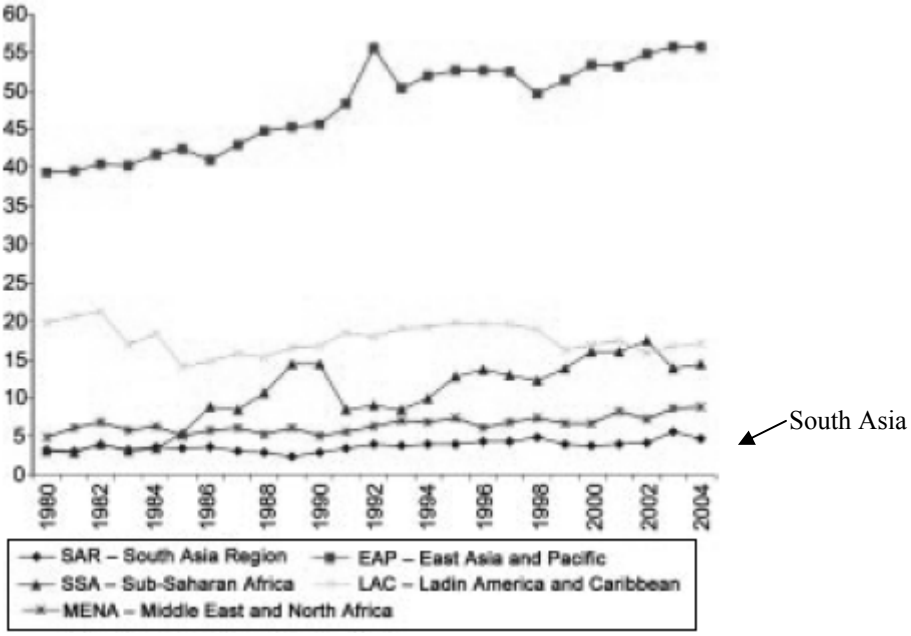
Regional economic integration is likely to yield net economic benefit when it leads to higher magnitude of trade creation than trade diversion. As far as it leads to trade creation, it is expected to raise competition in the domestic markets. Increased import competition results in lower prices for consumers, more product variety, higher quality, and increased incentives for innovation. By promoting a more efficient allocation of resources, import competition increases productivity, living standards, and long-term growth of the economy. Empirical studies have shown that the welfare consequences of trade liberalisation through regional trading arrangements generally tend to be positive.

While South Asia made significant progress in integrating with the global economy, integration within the region remained limited. South Asian countries have maintained a higher level of protection within the region than with the rest of the world. The region appears to be the least integrated region in the world (as can be perceived from Figure 1), when measured by intraregional trade in goods, capital, and ideas. Intra-regional trade as a share of total trade is the lowest for

[6] Such as real GDP, price level, exchange rate and money stock. See, for details, Ali F. Darrat and Fatima S. Al-Shamsi, "On the path of integration in the Gulf region", *Applied Economics*, 37, 2005, pp.1055-1062.

South Asia. The magnitude of cross-border investment within South Asia is also very small.[7]

Figure 1: Intra-regional Trade (% of World Trade)[8]



The principal motivation behind the regional economic integration in South Asia through SAPTA scheme was that it would generate significant intraregional trade and welfare gains for the countries of the region through removal of tariff and non-tariff barriers. This would also allow enjoying the gains of regional integration and, at the same time, to become more competitive in the global market. Critics argue that potential benefits from an FTA in South Asia are meagre because major trading partners of the individual South Asian countries are located in the West (as can be perceived from Table 1), there are limited complementarities in the region, etc.[9] It is also alleged that an RTA in South Asia will lead to substantial trade diversion than trade creation and it may work as a "stumbling bloc" to multilateral trade liberalisation.[10]

---

[7] Sadiq Ahmed and Ejaz Ghani, "South Asia's Growth and Regional Integration: An Overview", in Sadiq Ahmed and Ejaz Ghani (eds), *South Asia: Growth and Regional Integration*, Washington, DC: World Bank, 2007.

[8] *Ibid*.

[9] Nihal Pitigala, "What Does Regional Trade in South Asia Reveal about Future Trade Integration? Some Empirical Evidence", *Policy Research Working Paper 3497*, Washington, DC: World Bank, 2005; S.M. Hossain, and I. Selim, "Regional Cooperation in South Asia: Future of SAFTA", *BIISS Journal*, 28, 2007, pp.163-183.

[10] A. Panagariya, South Asia: Does Preferential Trade Liberalisation Make Sense? *World Economy*, 26, 2003, pp.1279-1291.

At present, South Asia combines a low level of regional integration and the presence of relatively high trade barriers. The proportion of intra-regional trade has increased in the last decade but still lags behind neighbouring trade blocs like ASEAN. Except for Nepal and Afghanistan, SAARC countries demonstrate meagre proportion of their intra-bloc exports. The share of intra-regional imports are, however, very small for India and Pakistan.

3. Methodology

The present study is based on time series analysis of economic variables of South Asian countries. In order to ascertain the extent of integration amongst the countries, the important economic variables that are used to examine the integration of a regional grouping have to be cointegrated. Before assessing such cointegration, the time series properties of the variables have to be examined.

3.1 Time Series Properties

To assess time series properties of the variables included, the paper adopts three popular tests: (i) Bertlett's white noise test, (ii) augmented Dickey-Fuller (ADF) unit root test and (iii) Phillips-Perron unit root test.

3.1.1 *Bartlett's white noise test*

Suppose that a series $X(1), \ldots, X(n)$ is a realisation of length n from a white noise, $WN(\sigma^2)$ process. Then the Bartlett's[11] test for white noise is based on the cumulative periodogram and uses the fact that

$$\lim_{n \Rightarrow \infty} p(B \succ b) = 1 - \sum_{j=-\infty}^{+\infty} (-1)^j e^{-2b^2 j^2}$$

where $q = [n/2] + 1$, e = exponent and the Bartlett test statistic B is given by

$$B = \max_{1 \le k \le q} \sqrt{q} \left| \hat{F}(\omega_k) - \frac{k}{q} \right|$$

Thus B measures the largest deviation of $\hat{F}$ from the white noise line $y = 2x$. If one observes a value b of the statistic B, other possible values of B are "more extreme" than b if they are bigger than b (a larger deviation of $\hat{F}$ from the line). Thus, the probability above is the p-value and we reject white noise if p-value $\prec \infty$.

---

[11] M.S. Bartlett, "A Note on the Multiplying Factors for Various χ^2 Approximation", *Journal of the Royal Statistical Society*, Series B, 16, 1954, pp.296-298.

3.1.2 *Augmented Dickey-Fuller test*

The augmented Dickey-Fuller test (ADF)[12] test is a popular unit root in a time series sample. The ADF statistic used in the test is a negative number. The higher the magnitude is negative, the stronger the rejection of the hypothesis that there is unit root at some level of confidence. The ADF test is performed on the following regression of a series *y*:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta\Delta\, y_{t-1} + \ldots + \delta\Delta\, y_{t-p} + \varepsilon_t$$

where α is a constant, β the coefficient on a time trend and p the lag order of the autoregressive process. Imposing the contraints $\alpha = 0$ and $\beta = 0$ corresponds to modelling a random walk and using the constraint $\beta = 0$ corresponds to modelling a random walk with a drift.

By including lags of order p, the ADF formulation allows for higher-order autoregressive processes. It implies that p has to be determined based on some scientific criteria to perform the test. One such approach is to test down from high orders and examine the *t*-values on coefficients. An alternative approach is to examine information criteria, such as the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC) or the Hannan-Quinn Information Criterion (HQIC).

The unit root test is then carried out under the null hypothesis $\gamma = 0$ against the alternative hypothesis of $\gamma < 0$. After getting a value for the test statistic

$$DF_\tau = \frac{\hat{\gamma}}{se(\hat{\gamma})}$$

it can be compared to the relevant critical value for the Dickey-Fuller Test. If the test statistic is less than the critical value, then the null hypothesis of $\gamma = 0$ is rejected and no unit root is present.

3.1.3 *Phillips-Perron test*

Phillips-Perron (PP)[13] test is a unit root test, which is used to test the null hypothesis that a time series is integrated of order 1, that is, *I*(1). Unlike the ADF test, it makes a non-parametric correction to the *t*-test statistic to capture the effect of autocorrelation present when the underlying autocorrelation process is not *AR*(1) and the error terms are heteroscedastic.

---

[12] S.E. Said and D. A. Dickey, "Testing for Unit Roots in Autoregressive-Moving Average Models of Unknown Order", *Biometrika*, 71, 1984, pp.599-607.

[13] P.C.B Phillips and P. Perron, "Testing for a Unit Root in Time Series Regression", *Biometrika*, 75, 1988, pp.335-346.

Specifically, consider y_t and ε_t to be the time series of observed data and model residuals, respectively. Then under the null hypothesis, PP test assumes that the true underlying process is

$$y_t = c + y_{t-1} + \varepsilon_t$$

for an arbitrary constant c. As an alternative, the estimated ordinary least squares (OLS) regression model is

$$y_t = c + \varphi\, y_{t-1} + \delta t + \varepsilon_t$$

for some constant c, $AR(1)$ coefficient $\varphi < 1$, and trend stationary coefficient δ.

3.2 *Cointegration test*

The best way of testing for unit roots is by using the system maximum likelihood (ML) estimator of Johansen[14] is a test for cointegration restrictions in a vector autoregression representation (VAR). This estimator also gives asymptotically efficient estimates of the cointegrating vectors and of the adjustment parameters.

Johansen's methodology takes its starting point in the VAR of order p given by

$$y_t = \alpha + \beta_1 y_{t-1} + \ldots + \beta_{t-p} + \varepsilon_t$$

where y_t is an $n\times1$ vector of variables that are $I(1)$ and t $\boldsymbol{\varepsilon}$ is an $n\times1$ vector of innovations. This VAR can be re-written as

$$\Delta y_t = \mu + \Pi\, y_{t-1} + \sum_{i=1}^{p-1} \Gamma\, y_{t-i} + \varepsilon_t$$

If the coefficient matrix Π has reduced rank $r<n$, then there exist $n\times r$ matrices α and β each with rank r. Here, r is the number of cointegrating relationship, the elements of α are the adjustment parameters in the vector error correction model and each column of β is a cointegrating vector. Johansen proposes two different likelihood ratio tests and thereby the reduced rank of the Π matrix: the trace test and maximum eigenvalue test,

$$J_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}_i) \text{ and}$$

[14] S. Johansen, "Statistical Analysis of Cointegration Vectors", *Journal of Economic Dynamics and Control*, 12, 1988, pp.231-254; and S. Johansen, "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models", *Econometrica*, 59, 1991, pp.1551-1580.

$J_{\max} = -T\ln(1-\hat{\lambda}_{r+1})$,

respectively. Here, T is the sample size and $\hat{\lambda}_i$ is the ith largest canonical correlation. The trace test examines the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating vectors. Conversely, the maximum eigenvalue test assesses the null hypothesis of r cointegrating vectors against the alternative hypothesis of r+1 cointegrating vectors.

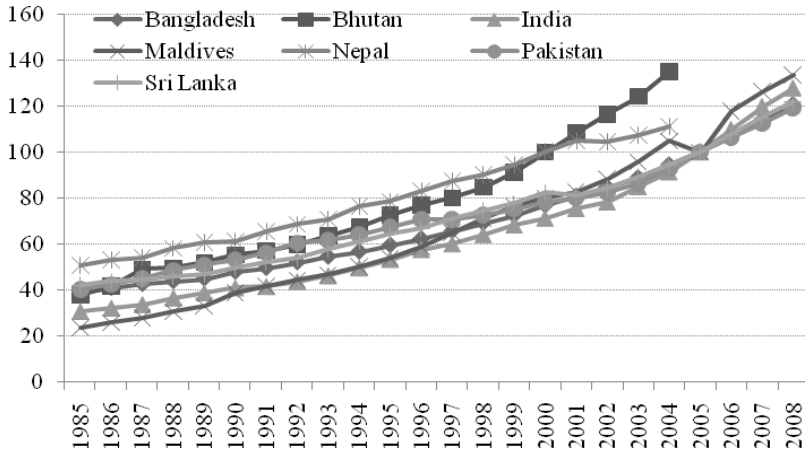
4. Results and Implications

The paper identifies three major macroeconomic variables to see whether they are individually integrated in the long run. These are: (i) real GDP, (ii) inflation rate, and (iii) exchange rate. The data come from the International Financial Statistics (online). The trend of these variables over the period 1985-2008 is portrayed in Figure 1.

From Figure 2(i) it can be clearly revealed that the direction of real GDP of South Asian countries is the same. This outcome is perhaps obvious as these countries are experiencing positive and steady growth for quite long. However, some fluctuations can be observed in the case of Maldives after 2003.

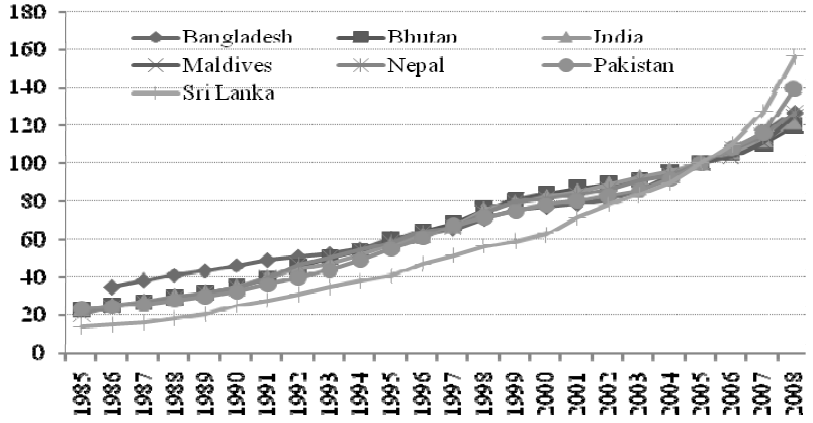
Figure 2: Movement of Macroeconomic Variables, 1985-2008

(i) *Real GDP* (*2005=100*)[15]

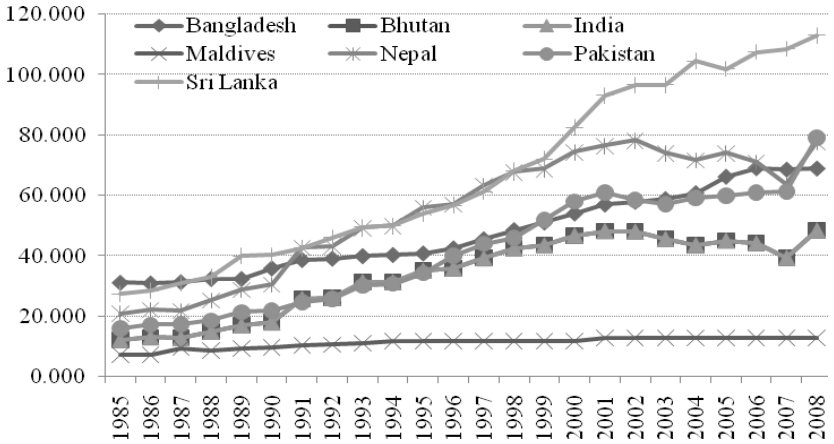


[15] For Bhutan and Nepal, 2000=100.

(ii) *Inflation Rate (Consumer Price Index)*



(iii) *Exchange Rate*



The rate of inflation of the countries, expressed by consumer price index (CPI), also indicates the same direction, an increasing pattern. However, although Sri Lanka's CPI had been lower than that of the other South Asian countries before 2003, it grew at a faster pace and crossed them in 2006.

On the contrary, a wide variation can be observed in the trend of exchange rate movement, although the lines indicate that the average trends of the individual countries are likely to be increasing. Therefore, it cannot be concluded, based merely on the simple graphical illustration, that the exchange rates are moving together.

4.1 *Time series properties*

To begin with, Bartlett's white noise test has been performed to understand the randomness (stationarity) of the data used in the analysis. Time series data tend to be non-random or non-stationary, which leads to inappropriate conclusion from adopting traditional regression analysis. Bartlett demonstrates that if a time series is purely random, *i.e.*, it exhibits "white noise", the sample autocorrelation coefficients are approximately normally distributed with zero mean and variance 1/*n*, where *n* is the sample size.

Table 3: Bartlett's White Noise Test

	Level		First Difference	
	B-statistic	*p*-value	B-statistic	*p*-value
lnGDP				
Bangladesh	2.14	0.000	1.09	0.187
Bhutan	2.02	0.000	0.65	0.785
India	2.07	0.000	1.15	0.140
Maldives	2.08	0.000	0.59	0.866
Nepal	2.15	0.000	0.58	0.877
Pakistan	1.97	0.000	0.87	0.422
Sri Lanka	2.14	0.000	1.20	0.112
lnCPI				
Bangladesh	1.96	0.000	1.08	0.185
Bhutan	2.19	0.000	2.13	0.000
India	2.17	0.000	1.60	0.011
Maldives				
Nepal	2.06	0.000	1.26	0.080
Pakistan	2.12	0.000	1.12	0.160
Sri Lanka	2.05	0.000	0.73	0.656
lnEXC				
Bangladesh	2.29	0.000	1.06	0.208
Bhutan				
India	2.37	0.000	0.66	0.769
Maldives	2.02	0.000	0.68	0.741
Nepal	2.38	0.000	0.60	0.858
Pakistan	2.21	0.000	0.52	0.948
Sri Lanka	2.25	0.000	0.53	0.936

Note: *p*-value indicates the exact level of significance in which the estimated sample autocorrelation function falls inside the 95 percent confidence interval.

The estimated Bartlett statistics and the associated *p*-values are presented in Table 3. These indicate that natural log of GDP (*ln*GDP) of all the countries exhibit white noise at the first difference. For Bhutan, India and Nepal, GDP

series are not purely random even at the first difference. However, the exchange rates of all the countries in the analysis demonstrate white noise at the first difference.

The randomness of time series used in the analysis can further be tested by adopting unit root tests. The popular unit root tests are ADF and PP, which are most widely used in the literature. The test results are reported in Tables 4 and 5. The upper panel of Table 4 indicates that series GDP is integrated of order 1, that is, it is stationary at the first difference. In the level, it is non-stationary for all the countries.

Table 4: ADF Test

	Level		First Difference	
	ADF-statistic	*p*-value	ADF-statistic	*p*-value
lnGDP				
Bangladesh	4.170	1.000	-3.234	0.018
Bhutan	0.947	0.993	-3.830	0.002
India	2.342	0.999	-3.213	0.019
Maldives	-1.309	0.625	-5.915	0.000
Nepal	-0.607	0.869	-5.828	0.000
Pakistan	1.665	0.998	-3.619	0.005
Sri Lanka	-0.175	0.941	-2.940	0.040
lnCPI				
Bangladesh	-0.354	0.917	-3.110	0.025
Bhutan	-3.661	0.004	-1.970	0.300
India	-3.075	0.028	-2.634	0.086
Maldives				
Nepal	-3.625	0.005	-3.499	0.008
Pakistan	0.158	0.969	-1.237	0.657
Sri Lanka	0.235	0.974	-2.714	0.071
lnEXC				
Bangladesh	-0.058	0.953	-3.523	0.007
Bhutan				
India	-2.131	0.232	-4.749	0.000
Maldives	-2.827	0.054	-6.485	0.000
Nepal	-2.094	0.246	-4.601	0.000
Pakistan	-0.751	0.833	-3.618	0.005
Sri Lanka	-1.472	0.547	-4.803	0.000

Note: The 1, 5 and 10 percent critical values are -3.750, -3.000 and -2.630, respectively.

The result of ADF test demonstrates that except for Pakistan and Bhutan, CPI is stationarity at first difference for all the countries. However, Pakistan's CPI remains non-stationary even at first difference. When second difference is

considered, it is found stationary. [16] Conversely, Bhutan's CPI is integrated of order zero, *i.e.*, it is stationary at level. Furthermore, except for Maldives, exchange rates of all the countries are stationary at first difference. For this country, it is stationary at level. The PP test draws similar conclusion about the stationarity of the three series.

Table 5: Phillips-Perron Test

	Level		First Difference	
	PP-statistic	*p*-value	PP-statistic	*p*-value
lnGDP				
Bangladesh	6.231	1.000	-3.240	0.017
Bhutan	0.927	0.993	-3.788	0.003
India	2.088	0.998	-3.263	0.016
Maldives	-1.723	0.419	-6.015	0.000
Nepal	-0.745	0.834	-6.037	0.000
Pakistan	-0.214	0.936	-2.891	0.046
Sri Lanka	1.545	0.997	-3.617	0.005
lnCPI				
Bangladesh	-0.354	0.917	-3.021	0.033
Bhutan	-2.849	0.051	-1.921	0.322
India	-2.721	0.070	-2.554	0.102
Maldives				
Nepal	-3.395	0.011	-3.501	0.008
Pakistan	0.021	0.960	-1.263	0.646
Sri Lanka	0.166	0.970	-2.701	0.073
lnEXC				
Bangladesh	-0.095	0.949	-3.523	0.007
Bhutan				
India	-2.303	0.170	-4.749	0.000
Maldives	-3.959	0.001	-6.485	0.000
Nepal	-2.292	0.174	-4.601	0.000
Pakistan	-0.753	0.832	-3.618	0.005
Sri Lanka	-1.569	0.499	-4.803	0.000

Note: The 1, 5 and 10 percent critical values are -3.750, -3.000 and -2.630, respectively.

4.2 *Cointegration*

The unrestricted Johansen-Juselius cointegration test has been performed to comprehend whether there is any long term or equilibrium relationship exists in three core macroeconomic variables amongst South Asian countries. We assume a linear deterministic trend while examining cointegration. However, it is argued that the data used in the unit root and cointegration analysis remain below the

[16] Not reported separately.

required number of observation[17]; we had to rest on sample because of paucity of very long period of data for these variables.

The unrestricted Johansen-Juselius trace test indicates that at most five cointegrating vectors exist amongst the GDP of seven South Asian countries. This finding seems to be significant as it indicates most of the country's economy has long-run relationship with the other.

Table 6*a*: Unrestricted Johansen-Juselius Cointegration Test (trace) for *lnGDP*

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.979	248.427	125.615	0.000
At most 1*	0.955	162.686	95.753	0.000
At most 2*	0.736	93.978	69.818	0.000
At most 3*	0.679	64.617	47.856	0.000
At most 4*	0.661	39.551	29.797	0.002
At most 5*	0.507	15.739	15.494	0.045
At most 6	0.008	0.177	3.841	0.673

Notes: The countries are Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Trace test indicates 6 cointegrating equation(s), CE(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) *p*-values.

The result of Maximum Eigenvalue is, however, contradictory by indicating the existence of at most one cointegrating relationship, *i.e.*, two are cointergated amongst GDP of seven countries only. However, the paper relies on the maximum eigenvalue test since the results vary between maximum eigenvalue and trace tests. As Johansen and Juselius suggest, the earlier test performs better.

[17] For example, see, J.H. Stock, "Unit roots, structural breaks and trends", in: R.F. Engle and D.L. McFadden (eds.), *Handbook of Econometrics*, Volume 4, Amsterdam: North-Holland, 1994, pp. 2739-2841; H.Y. Toda, "Finite sample properties of likelihood ratio tests for cointegrating ranks when linear trends are present", *Review of Economics and Statistics*, 76, 1994, pp.66-79; and H.Y. Toda, "Finite sample performance of likelihood ratio tests for cointegrating ranks in vector autoregressions", *Econometric Theory*, 11, 1995, pp.1015-1032.

Table 6*b*: Unrestricted Johansen-Juselius Cointegration Test (Maximum Eigenvalue) for *lnGDP*

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.979	85.741	46.231	0.000
At most 1*	0.955	68.708	40.077	0.000
At most 2	0.736	29.360	33.876	0.157

Notes: The countries are Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Trace test indicates 6 cointegrating equation(s), CE(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) *p*-values.

In the case of price level or inflation, it is observed that five cointegrating vectors from five cointegrating equations are in trace test. However, the number of cointegrating vectors appears to be three in the Maximum Eigenvalue test, indicating that three CPI of at the most three countries are cointegrated. In this case also the paper prefers the results of Maximum Eigenvalue. However, in this case the discrepancy remains low between two test results.

Table 7*a*: Unrestricted Johansen-Juselius Cointegration Test (trace) for *ln*CPI

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.982	239.920	95.753	0.000
At most 1*	0.978	151.478	69.818	0.000
At most 2*	0.720	67.357	47.856	0.000
At most 3*	0.619	39.328	29.797	0.003
At most 4*	0.460	18.074	15.494	0.020
At most 5*	0.185	4.518	3.841	0.033

Notes: The countries are Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. Trace test indicates 5 cointegrating equation(s), CE(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) *p*-values.

Table 7*b*: Unrestricted Johansen-Juselius Cointegration Test (Maximum Eigenvalue) for *ln*CPI

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.982	88.442	40.077	0.000
At most 1*	0.978	84.121	33.876	0.000
At most 2*	0.720	28.028	27.584	0.043
At most 3*	0.619	21.254	21.131	0.048
At most 4	0.460	13.556	14.264	0.064

Notes: The countries are Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. Trace test indicates 5 cointegrating equation(s), CE(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) *p*-values.

The findings of cointegration of exchange rates of South Asian countries are particularly encouraging. Although in this case the trace test indicates three cointegrating vectors, the Maximum Eigenvalue test indicates four. It indicates that exchange rate of most of the countries have long term or stable relationship.

Table 8*a*: Unrestricted Johansen-Juselius Cointegration Test (Trace) for *ln*EXC

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.945	181.095	95.753	0.000
At most 1*	0.891	117.273	69.818	0.000
At most 2*	0.763	68.309	47.856	0.000
At most 3*	0.623	36.568	29.797	0.007
At most 4	0.495	15.049	15.494	0.058

Notes: The countries are Bangladesh, India, Maldives, Nepal, Pakistan and Sri Lanka. Trace test indicates 5 cointegrating equation(s), CE(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) *p*-values.

Table 8*b*: Unrestricted Johansen-Juselius Cointegration Test (Maximum Eigenvalue) for *ln*EXC

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.945	63.822	40.077	0.000
At most 1*	0.891	48.963	33.876	0.000
At most 2*	0.763	31.741	27.584	0.013
At most 3*	0.623	21.518	21.131	0.044
At most 4*	0.495	15.042	14.264	0.037
At most 5	0.000	0.006	3.841	0.935

Notes: The countries are Bangladesh, India, Maldives, Nepal, Pakistan and Sri Lanka. Trace test indicates 5 cointegrating equation(s), CE(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) *p*-values.

The main finding of the analysis is quite interesting. Despite undertaking a number of measures in economic front including establishing a trade bloc in South Asia, there is an absence of a significant degree of economic integration as expressed in fewer cointegrating vectors amongst the GDP and price level of these countries. Rather, there is a strong tendency of higher degree of financial integration, which is evident from the Maximum Eigenvalue test of cointegration in the exchange rates of these countries. This result conveys a powerful policy implication: the regional policymakers should uncover the catalysts of financial integration and harness so as to attain market-driven integration within the region.

5. Concluding Remarks

Established in two and a half decades back, SAARC's initial primary focus was on technical cooperation, covering agriculture, environment and meteorology, communications, education, health and population control activities, culture and sports, prevention of drug abuse and trafficking, tourism, transport, science and technology, confidence building, rural development and women's development. Later on, member countries realised that economic cooperation will have significant impetus in uplifting lives of half of the world's poor people living in South Asia. As a result, SAPTA and the latest SAFTA came into the central point of economic cooperation and integration scheme.

The traditional studies of economic integration of regional groupings are mainly centred on the intra-bloc trade, and trade and welfare effects of preferential liberalisation schemes. On the contrary, the present paper examines the long-term stable relationship of key economic variables amongst South Asian countries by adopting cointegration tests. To examine time series properties of the variables, Bertlett's white noise, ADF and PP tests have been performed. Cointegration analyses reveal that there is a greater cointegrating tendency in the financial variable, exchange rate, while key macroeconomic variables GDP and price level exhibit lower degree of cointegration. This implies that the South Asian countries would attain greater success if they undertake schemes of financial market integration. An important initiative in that process would be to harmonise monetary policies of the SAARC members. Moreover, future studies should devote on examining the catalysts of financial integration and harness such factors to attain greater integration in South Asia.