



IMPACT OF SAFTA ON CAPITAL MARKET INTEGRATION OF SOUTH ASIA: EVIDENCE FROM COINTEGRATION ANALYSIS

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Abstract: *Regional Trade agreements (RTAs) are increasing worldwide because of associated economic benefits such as increased cross border investment and trade, development and integration markets. This paper investigates how South Asian Free Trade Agreement (SAFTA) impact on the integration of South Asian capital markets. Weekly data of capital market indices of three countries (India, Pakistan and Sri Lanka) have been analyzed for overall (1998-2017) and two sub periods, 1998-2006 (Pre SAFTA) and 2009-2017 (Post SAFTA). Correlation coefficients, Unit root tests and Johansen and Juselius (JJ) Cointegration technique has been applied to access the integration between the markets. The main findings suggest that integration between the South Asian capital markets has been increased in Post-SAFTA period. The evidence that SAFTA pact results in increased integration of regional capital markets has important implications for investors and policymakers.*

Keywords: *Regional Trade Agreements, SAFTA, Capital Markets, SAARC, unit root test, Cointegration.*

JEL Classification: *F36, F04, F60, G1*

1. INTRODUCTION

Last two decades evidenced many Regional Trade Agreements (RTAs onwards) and economic blocs, around the world. Their prime objective is to accelerate economic growth, economic cooperation, liberalization, and market integration. The literature on the advantages of RTAs and their impact on the integration of capital markets is growing rapidly. Integration of capital markets

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means comparable and correlated prices/returns on the assets issued and traded in different countries (Stulz, 1981). Aggarwal and Kyaw (2005) found the positive impact of NAFTA agreement on the integration of three capital markets (Canada-Mexico-US) North American region. Hooy and Goh (2007) studied 26 stock markets and 5 free trade blocs and concluded that RTAs have a significant role in capital market integration. EU stock markets have a higher level of integration, while EFTA and AFTA markets have a lower level of integration. However, there is no study focusing on RTAs and capital market integration in South Asian region.

A regional trade agreement known as South Asian Association for Regional Cooperation (SAARC onward) was initiated in 1985 between seven south Asian countries that is Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The main objective of SAARC is to enhance “accelerated economic growth, social progress and cultural development in the region” for the welfare of the region and peoples (SAARC Secretariat, 2006). To achieve above targets, in 1995, a South Asian Preferential Trading Agreement (SAPTA) was signed among SAARC countries. However, unfortunately, SAPTA failed to achieve the desired outcomes to enhance the regional cooperation. Then again in early 2004, SAARC member countries come together to form a regional trade agreement. As a result, South Asian Free Trade Agreement (SAFTA) was initiative in 2006 to promote regional cooperation among SAARC countries (Weerakoon and Thennakoon, 2006). SAFTA was introduced to overcome the hurdles that SAPTA could not handle to develop regional cooperation. The south Asian region is considered as less developed as compared with other regions. The proponents of regional trade agreements (RTAs) expect SAFTA to increase the intraregional trade and welfare in the region. It will have a positive impact on the businesses and it will improve the market access of the region, there will be a boost in the exports among the SAARC countries, and overall trade will increase. Eventually, the all the markets will come closer to each other and integration among the stock markets of SAARC countries is expected to be increased.

The purpose of this study is to expand the empirical literature on RTAs and capital markets integration by analyzing the impact of SAFTA (South Asian Free Trade Agreement) on the integration of capital markets of South Asia. We use weekly benchmark stock indices data of three Non-LDC (Least developed countries) stock markets i.e. Nifty 500 for India, KSE 100 index for Pakistan and

CSE all share index for Sri Lanka for cointegration analysis. Overall period of study (1998-2017) has been divided into two sub periods, Pre and Post SAFTA. The period from 30 June 1998 to 30 June 2006 is classified as Pre-SAFTA sub period and Post SAFTA sub period is from 1 July 2009 to 30 June 2017. The period from 2007-2009 is excluded because of great financial depression. We apply the ADF, PP and KPSS unit root tests to check the stationarity of data and JJ cointegration to find the long run relationship before and after IFRS adoption. Results show that there is cointegration between the three markets for the Overall, Pre-SAFTA and Post-SAFTA period in weekly series. However, cointegration increased in the Post-SAFTA period. In other words, SAFTA passage results in an increased integration between the South Asian capital markets.

The current study contributes to the RTAs consequences research by providing the evidence from the unexplored area of South Asia. It also extends the capital markets integration research by providing the first evidence (to the best of our knowledge) about the impact of SAFTA on capital markets integration of South Asia. Findings of this study are important for investors, managers, policymakers, and scholars of not only South Asian countries, but also other countries who are interested in this region. If the markets are integrated investor have better liquidity and portfolio diversification, business managers and policymakers will take their decisions accordingly.

The rest of the paper is organised as follow: section 2 gives the further insight of literature review and background; section 3 explains the data and methodology used; section 4 discusses the empirical results and findings, and section 5 gives the conclusions and recommendations.

2. LITERATURE REVIEW AND BACKGROUND:

In 1985, South Asian Association for Regional Cooperation (SAARC) was initiated as a result of the political meeting. During its initial years, it does not have great success in promoting trade preferences among its member's countries. In 1993 SAARC plan to create the South Asian Preferential Trade Area (SAPTA) and finally it incorporated in 1995, However, the actual exchange of preferences remained extremely limited (Panagariya, 2002). The SAPTA framework provides for periodic rounds of trade negotiations for the exchange of trade concessions on tariff, para-tariff and non-tariff measures using a combination of negotiating

approaches. In view of the modest progress made in the initial years, the deadline for a free trade area, which was finally envisaged for 2001-2005, has been postponed to 2008 for non-LDC members (India, Pakistan and Sri Lanka) and 2010 for LDC members (Bangladesh, Bhutan, Nepal, and Maldives).

SAARC evolved over the time for regional economic growth and welfare. Formation of SAPTA (1995) in which there were commodity-by-commodity negotiations between the SAARC countries for tariffs was the first step for the free trade. However, it was not beneficial because of highly laborious and time taking work. And it did not achieve the desired impact on the intra-regional trade. A milestone in the advancement of the SAARC was the signing of SAFTA in January 2006, during the 12th SAARC summit held at Islamabad, Pakistan. The idea takes the SAARC a step ahead from the mere trying out tariffs under SAPTA to establish a regional free trade area. The SAFTA agreement has greater potential than just trade liberalization and economic integration. If it achieves its objectives, the region will attract more foreign investments and trade, which result in fastest economic growth in South Asian countries (Mehta and Kumar, 2005). Sultana and Asrat (2015), and Regmi et al. (2017) found an increase in the bilateral exports and imports, among the SAARC member countries in post SAFTA period. As a result, markets will come closer to each other, and integration among the stock markets is expected to be increased.

Researchers almost agreed on the positive impact of recent trade liberalizations and globalization on the enhancement overall welfare of the society. However, the impact of regional free trade agreements on capital markets is inconclusive and debatable (e.g. Bhagwati and Panagariya, 1999). There is a number of studies which focused on the advantages of RTAs and their impact on the integration of Capital markets. Like for NAFTA region, Easterly et al. (2003) measure the impact of NAFTA on the economic convergence of North American region and conclude that institutional differences among countries are a hindrance in economic convergence and convergence seems stuck. However, Aggarwal and Kyaw (2005) found the positive impact of NAFTA agreement on the integration of three capital markets. Adjaouté and Danthine (2000) examine the integration between the EU capital markets, from the variance-covariance matrices of weekly returns they conclude that there is significant increase in the correlation of stock returns, whether computed on the basis of market indices or sector indices.

Fratzscher (2002) analyzed the daily returns with a GARCH model and evidenced an increased correlation between stock returns within the Euro area. Hooy and Goh (2007) studied 26 stock markets and 5 free trade blocks and conclude that economic bloc plays an important role in stock market integration. The level of integration is highest among stock markets in the EU countries, while those in EFTA and AFTA are most segmented.

In the South Asian region, intraregional trade is very low compared to other regions. The major reason for this low trade is high tariff rates among the countries. South Asia, as a region, has higher average tariff rates than in any other region in the world (Raihan, 2012). However, policy makers and business community of the region are optimistic about SAFTA. SAFTA has significant potentials to expand trade among the member countries. It is also hoped that the member countries will be able to gain significantly by having greater market access in other South Asian countries and especially in India. Raihan (2012) concludes that benefits from trade acceleration in South Asia are much higher than the gains from a mere reduction in tariff in goods. Therefore, in order to make SAFTA effective, trade liberalization is a necessary condition, but not a sufficient one. With the passage of time the integration among the countries will increase.

Above studies provide the importance of regional trade and economic agreements and their impact on the integration of different markets. It is also concluded that SAFTA has a potential to impact on the SAARC capital markets. However, how the SAFTA will impact on the regional capital markets integration has not been investigated yet, which is the main objective of the current study.

RTAs eliminate the barriers to cross border trade and align the legal and regulatory bodies, previous studies document that such RTAs result in increased economic integration of the territories (Mehta and Kumar, 2005). Cross border equity investments result in lower cost of capital, and as a result of RTAs cross border investments of the region increased, which may result in the greater integration of capital markets. Same is expected for the SAARC region that SAFTA increases the capital market integration of the region. However, if countries cross border trade and investment is not increased by SAFTA than capital markets may behave locally rather than regionally, and there are lower chances of capital markets integration.

3. RESEARCH DESIGN, METHODOLOGY, AND DATA

Integration of capital markets means comparable and correlated returns on the assets issued and traded in different countries (Stulz, 1981). The coefficient of correlation and cointegration tests are well recognized to measure the integration between stock markets, (e.g. Chung and Liu, 1994, Kasa, 1992, Richards, 1995, Darrat and Zhong, 2005, Atteberry and Swanson, 1997). Similarly, current study analyzed the impact of SAFTA agreement on the integration of stock markets by using correlation coefficients and cointegration tests. There are total eight countries in the SAARC region. However, only three countries have well-developed stock markets so the study is considering only those.

Benchmark indices of each market are used to represent the whole stock market, that is S&P BSE-100 Index as a proxy for Indian, KSE-100 index for Pakistani, and CSE all share index for the Sri Lankan stock markets. Weekly stock prices data have been gathered from the Thomson Reuters Eikon DataStream for analysis.

Weekly data on stock prices for the period of nineteen years starting from 30 June 1998 ending on 30 June 2017 have been downloaded from the Thomson Reuters Eikon datastream. In order to capture the incremental impact of SAFTA agreement on the integration, overall period of study has been divided into two sub periods, Pre and Post SAFTA. The period from 30 June 1998 to 30 June 2006 is classified as Pre-SAFTA sub period and Post SAFTA sub period is from 1 July 2009 to 30 June 2017. The period from 1st July 2006 to 30th June 2009 has been excluded from analysis because of great financial depression of 2007-2009. All the analysis are made for the overall period and for each of the two sub periods using weekly stock indices prices data.

Correlation coefficient analysis:

One widely applied approach to access the global capital market integration in economics and finance literature is by calculating the correlation between the stock indices. Bekaert and Harvey (1995) are first to use this approach, later on (Cai & Wong, 2010; Chambet & Gibson, 2008; Goetzmann & Rouwenhorst, 2004; Heston & Rouwenhorst, 1994) also used the correlation coefficient to examine the capital market integration. In order to calculate the Pearson Correlation coefficient;

first of all, stock returns are calculated by taking the natural logarithm of one lag difference of stock prices. With the following formula,

$$R_{i,t} = \ln(P_{i,t}/P_{i,t-1}) \quad (1)$$

Where $R_{i,t}$ is the stock return of i 's country for the time t , \ln is the natural logarithm operator and P represent the stock price of i 's country for the time t .

Then Pearson's correlation coefficients were calculated by using the weekly returns calculated with the above formula for the both Pre-SAFTA and Post-SAFTA Periods. Then these coefficients are compared in two periods to access the increase or decrease in correlation, which is the proxy for integration.

Cointegration Analysis:

Cointegration modeling is a widely used approach to investigating long-run equilibrium of returns among capital markets. Previously a number of studies, use the similar analysis to access the integration between markets like Serletis and King (King, 1997) analyzed the convergence of EU stock markets. While (Click & Plummer, 2005; Manning, 2002; Yabara, 2012; Yu, Fung, & Tam, 2010) apply this cointegration analysis to access Asian capital market integration. Specifically, we used the following model in error correction model (ECM) framework with l lags is considered:

$$\Delta P_t = v + \alpha P_{t-1} + \sum_{i=1}^l \mu_i \Delta P_{t-1} + \varepsilon_t \quad (2)$$

where P_t is a $(n \times 1)$ vector of stock prices at time t , v is a $(n \times 1)$ vector of parameters, α is a $(n \times r)$ parameter matrix with rank $r < n$, μ_1, \dots, μ_l are $(n \times n)$ matrices of parameters, and ε_t is a $(n \times 1)$ vector of random errors.

Where the parametric matrix μ indicates whether the vector of stock prices (P_t) has long run equilibrium dynamic relationship or not. The core of the approach is to identify r , a number of cointegrating vectors. If n variables with unit roots have r cointegrating relationships, they have been $n - r$ common stochastic trends. Thus if r equals $n - 1$, stock markets are perfectly integrated under one common long-run trend. Alternatively, if r equals 0, all data series are independent (Kasa, 1992).

Johansen and Juselius (Johansen & Juselius, 1990) derive two likelihood-ratio tests to infer on r , known as the trace statistics and the maximum-eigenvalue statistics. But these tests are only valid if the data series is of same integration order.

Before applying the cointegration test, it is important to check the stationarity of the time series as cointegration tests are sensitive to stationarity moreover, some time series is not stationary. So, Unit root tests (ADF, PP, and KPSS) are applied to check the order of integration.

4. EMPRICAL FINDINGS

Descriptive Statistics:

Table 1 presents the descriptive statistics for weekly stock returns for the three countries studied, India, Pakistan and Sri Lanka for three periods. The findings show that the Pakistani stock index (KSE100 index) have higher mean returns compared with India and Sri Lanka in all the periods, while Indian stock index (BSE100 index) have the lowest mean returns. Pakistan and Sri Lanka have a higher standard deviation in Pre-SAFTA period while in Post-SAFTA period India has the higher standard deviation. As is common for such series, there is skewness and kurtosis in these data with higher levels of kurtosis for each of the three series. However, skewness shows a negative pattern for India and Pakistan in Pre-SAFTA period while positive for other. Overall, KSE100 index is performing well among the three countries. Jarque-Bera test results show that there is no issue of normality for these data series.

Table 1: Descriptive Statistic (Returns)

	Panel A: Pre-SAFTA			Panel B: Post SAFTA			Panel C: Overall		
	<i>BSE100</i>	<i>KSE100</i>	<i>CSEA</i>	<i>BSE100</i>	<i>KSE100</i>	<i>CSEA</i>	<i>BSE100</i>	<i>KSE100</i>	<i>CSEA</i>
<i>Mean</i>	0.0032 4	0.0113 3	0.0086 1	0.0018 9	0.0044 8	0.0024 2	0.0025 6	0.0079 0	0.0055 2
<i>Median</i>	0.0060 8	0.0071 4	0.0017 1	0.0029 3	0.0062 4	0.0002 6	0.0041 9	0.0068 6	0.0009 3
<i>Max</i>	4.6381	4.6578	4.6628	4.6368	4.6387	4.6411	4.6381	4.6578	4.6628
<i>Mini</i>	- 4.6 28 7	- 4.6 60 4	- 4.6 28 7	- 4.6 01 6	- 4.6 13 6	- 4.6 24 3	- 4.6 28 7	- 4.6 60 4	- 4.6 28 7
<i>Std. Dev.</i>	1.1932	1.3483	1.3123	1.2149	1.0212	1.1265	1.2034	1.1953	1.2222
<i>Skewness</i>	0.0001	0.1303	0.0675	0.0063	0.3171	0.0162	0.0032	0.0077	0.0492

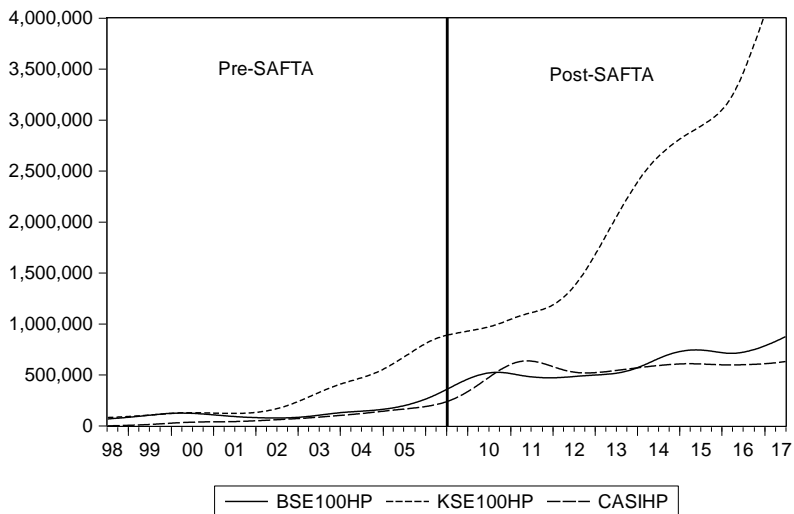
Kurtosis	7.7189	7.3028	6.6498	6.5680	11.044 6	10.169 7	7.1250	8.8310	8.0698
J-Bera	387.84	323.63	232.32	221.73	1134.1 4	895.30	592.71	1184.3 4	895.66
N	418	418	418	418	418	418	836	836	836

Note 1: BSE 100 represents the Bombay Stock Exchange 100 index (India), KSE 100 Index represents the Karachi Stock Exchange 100 Index (Pakistan) and CSE All Share represents Colombo Stock Exchange All Share (Sri Lanka).

Note 2: throughout the manuscript, *, **, *** denote significance at the 10%, 5%, and 1% significance levels respectively.

Note 3: Period from 1 July 1998 to 30 June 2006 is Pre-SAFTA, and the period is from 1 July 2009 to 30 June 2017 posts SAFTA period. The overall period spans from 1 July 1998 to 30 June 2017. However, the period from 1st July 2006 to 30th June 2009 has been excluded from analysis because of great financial depression of 2007-2009.

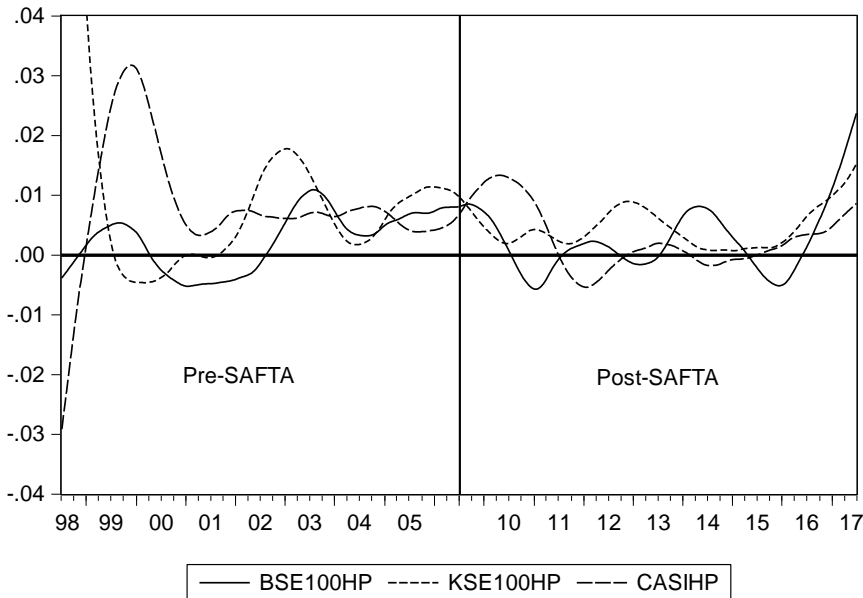
Fig. 1 shows the plot of weekly stock index prices. From the graphic inspection of the plot we can see that up till 2001 the stock prices of all three countries have similar patterns, later on, Pakistani stock prices goes up. While Indian and Sri Lankan index prices remain close to each other. Overall, there is an increasing trend in the stock prices of all three countries.



Note 1: BSE 100 represents the Bombay Stock Exchange 100 index (India), KSE 100 Index represents the Karachi Stock Exchange 100 Index (Pakistan) and CSE All Share represents Colombo Stock Exchange All Share (Sri Lanka).

Note 2: Prices are scaled with **Hodrick-Prescott (HP) filter** for the smooth view and trend analysis. The lambda value used is 270400 because of weekly data.

Figure 2: shows the weekly returns of all three stock markets. Returns are scaled with **Hodrick-Prescott (HP) filter** for the smooth view and trend analysis. The lambda value used is 270400 because of weekly data. Overall, returns graph shows a similar trend in all three markets except the start of the period when the Pakistani stock returns are decreasing while the Sri Lankan is increasing.



Note 1: BSE 100 represents the Bombay Stock Exchange 100 index (India), KSE 100 Index represents the Karachi Stock Exchange 100 Index (Pakistan) and CSE All Share represents Colombo Stock Exchange All Share (Sri Lanka).

Note 2: Prices are scaled with **Hodrick-Prescott (HP) filter** for the smooth view and trend analysis. The lambda value used is 270400 because of weekly data.

Table 2 shows the person correlation matrices of all the three countries for the weekly stock returns. The lower diagonal part shows the Post-SAFTA correlations while upper diagonal bold part represents the Pre-SAFTA correlations. Overall, all the correlations are small, Pakistani stock index have negative correlations with both Indian and Sri Lankan markets while Indian and Sri Lankan markets have a positive correlation with each other in the Pre-SAFTA. In Post-SAFTA period, there is a small negative correlation between all the returns.

Correlation coefficient has not evidenced any integration between the markets, we need a further powerful test to check the behavior of the markets.

Table 2: Correlations (Returns)

	<i>BSE100</i>	<i>KSE100</i>	<i>CSEAI</i>
<i>BSE100</i>	1	-0.0245	0.0246
<i>KSE100</i>	-0.0202	1	-0.0493
<i>CSEAI</i>	-0.0092	-0.0558	1

Note 1: BSE 100 represents the Bombay Stock Exchange 100 index (India), KSE 100 Index represents the Karachi Stock Exchange 100 Index (Pakistan) and CSE All Share represents Colombo Stock Exchange All Share (Sri Lanka).

Note 2: The overall period is divided into two sub periods—the pre and post- SAFTA periods. Upper diagonal Pre-SAFTA (July 1998-June, 2006) and Lower diagonal (**bold**) Post-SAFTA (July 2009-June,2017).

Unit root Tests:

Before applying the cointegration test, it is important to check the stationary of the time series as cointegration tests are sensitive to stationarity (Stock and Watson, 1989) moreover some time series may not be stationary. Therefore, first of all, we apply the unit root tests to check the order of integration. Three methodologies Augmented Dickey Fuller (ADF) unit root test by Dickey and Fuller (Dickey & Fuller, 1979)), Philips-Perron (PP) unit root test by (Perron, 1988; Phillips, 2008), and Kwiatkowski-Philips-Schmidt-Shin (KPSS) stationarity test by (Kwiatkowski, Phillips, Schmidt, & Shin, 1992) are applied to all country's indexes data, for the overall, Pre-SAFTA and Post-SAFTA periods, for levels as well as first differences, with and without intercept to analyze unit roots. Lag lengths are determined by Schwarz information criteria (SIC) for ADF while Bandwidths are determined with bartlett kernel estimation criteria in PP and KPSS. Table 3 reports the results of unit roots for India, Pakistan, and Sri Lanka.

PP	<i>Ist</i>	-											
	<i>d</i>	11											
	<i>i</i>	8.2											
PP	<i>f</i>	**											
	<i>f</i>	*	14										12
	<i>f</i>			*	62								
KPS	<i>Ist</i>	-											
	<i>d</i>												
	<i>i</i>												
S	<i>f</i>	0.08***	19	0.17***	44	0.22***	13	0.02***	19	0.05***	44	0.16*	13
	<i>f</i>												
	<i>f</i>												

Panel: C CSE All Share (Sri Lanka)

AD	F	<i>level</i>	<i>s</i>	-1.41	7	0.37	13									
PP	KPS	<i>level</i>	<i>s</i>	9.7	17	8.0	11									
				*		*										
				**		**										
S	<i>level</i>	<i>s</i>	3.27	23	2.34	16	0.91	13	0.31	21	0.61	12	0.22	12		
AD	F	<i>Ist</i>	<i>d</i>	20.51		11.22		14.42		20.49		11.28		14.42		
				**		**		**		**		**		**		
				*	6	*	12	*	6	*	6	*	12	*	6	
PP	KPS	<i>Ist</i>	<i>d</i>	17		25		10		17		40		11		
				3.8		8.6		8.9		3.6		2.1		1.7		
				**		**		**		**		**		**		
S	<i>Ist</i>	<i>d</i>	<i>i</i>	*	87	*	41	*	59	*	87	*	41	*	59	
KPS	S	<i>Ist</i>	<i>d</i>	0.08***	12	0.13***	62	0.09***	59	0.08***	12	0.08***	62	0.07***	59	

Note: 1 ADF, PP, and KPSS refer to Augmented Dickey Fuller, Philips-Perron and Kwiatkowski-Philips-Schmidt-Shin unit root tests.

Nifty 500 represents the National Stock Exchange of India index, KSE 100 Index represents the Karachi Stock Exchange of Pakistan 100 Index and CSE All Share represents Colombo Stock Exchange All Share.

l represents Lag length and bandwidths. Lag lengths are determined by Schwarz information criteria (SIC) for ADF. Bandwidths in PP and KPSS are determined with Bartlett kernel estimation criteria.

Note 2: throughout the manuscript, *, **, *** denote significance at the 10%, 5%, and 1% significance levels respectively.

Note 3: Test critical values for the ADF(intercept) are -3.441, -2.866, and -2.569 for 1%, 5% and 10% significance levels respectively. Similarly, asymptotic critical values for ADF (trend and intercept) are -3.974, -3.418, and -3.131 for 1%, 5% and 10% significance levels respectively. Test critical values for the PP (intercept) are -3.436, -2.864, and -2.568 for 1%, 5% and 10% significance levels respectively. Similarly, asymptotic critical values for PP (trend and intercept) are -3.966, -3.414, and -3.129 for 1%, 5% and 10% significance levels respectively. Asymptotic critical values for the KPSS (intercept) are 0.739, 0.463, and 0.347 for 1%, 5% and 10% significance levels respectively. Similarly, asymptotic critical values for KPSS (trend and intercept) are 0.216, 0.146, and 0.119 for 1%, 5% and 10% significance levels respectively.

From the results reported in table 3, PP test results fail to reject the null hypothesis of a unit root for all the series during all three periods. ADF provide mixed results for level data but reject the unit root hypothesis for first differences in all series. However, KPSS reject the null hypothesis of stationarity in levels but fail to reject the null hypothesis in case of first difference of series in all the three periods. Therefore, we conclude that all three stock indexes are not stationary at levels but their 1st difference is stationary during all three periods⁶. So the results are consistent with the overall weak form of stock market efficiency. We conclude that all the three indices are I(1) series.

JJ Cointegration Analysis:

The co-movement of stock prices between different markets represent the integration between them. Since all the series are of same integration order, I (1) we applied JJ cointegration (1990) test to analyse whether stock returns hold any long run equilibrium relationship or not. In order to apply cointegration test first of all lag, lengths are determined in VAR framework, using all five information criteria: i-e LR, Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC), Hannan-Quinn information criterion(HQ). For an overall period of series, LR, FPE, and AIC tests suggest optimum lag length as twelve (12) when we apply these criterias with maximum lag length 13 and above while SC suggests 6 and HQ suggest 8 optimum lags. So for JJ cointegration, we will use 12 lags. Similarly, For Pre-SAFTA series, three out of five criteria suggest the optimum lag length is 9 when we apply these criterias with maximum lag length 9 or above. For Post-SAFTA series, four out of five criteria suggest the optimum lag length is six when we apply these criterions with maximum lag length 6 or above.

⁶ It is a general rule of statistic about hypotheis testing that a null hypothesis can only be affirmed not proved. However, rejecting a null hypothesis menas it is really not true. Thus alternative hypothesis is always a stronger hypothesis than the null hypothesis.
<https://stats.stackexchange.com/questions/30569/what-is-the-difference-between-a-stationary-test-and-a-unit-root-test/235916#235916>

Table 4: JJ cointegration tests for SAARC equity markets Before and after SAFTA agreement

		rank	λ -Trace	5% CV*	λ -max	5% CV*
<i>Ind-Pak-SL</i>	Overall period	$r=0$	31.013	29.797	25.408	21.132
		$r \leq 1$	5.605	15.495	4.858	14.265
		$r \leq 2$	0.747	3.841	0.747	3.841
	Pre-SAFTA	$r=0$	50.782	29.797	36.854	21.132
		$r \leq 1$	13.928	15.495	13.572	14.265
		$r \leq 2$	0.356	3.841	0.356	3.841
	Post-SAFTA	$r=0$	57.456	29.797	32.870	21.132
		$r \leq 1$	24.586	15.495	23.306	14.265
		$r \leq 2$	12.794	3.841	1.279	3.841

Note 1: *Ind-Pak-SL* represents *India-Pakistan-Sri Lanka* respectively. λ -Trace represents Trace Statistic and λ -max Max. Eigen statistic respectively.

Note 2: Johansen cointegration tests are used allowing for a constant term, but no trend, in the cointegrating equation and linear deterministic trend in data for the system of all three stock exchanges.

Table 4, shows the results of JJ (1990) cointegration test, which represents the Trace statistic, Max Eigen statistic at 5% confidence level value, for all three markets. Results of both trace statistic as well as max. eigen statistic suggests the existence of single cointegration vector at 5% significance level among the three markets for the overall period and Pre-SAFTA periods. While in case of Post-SAFTA, both max. eigen values and trace statistic suggest the existence of two cointegration vectors among three markets. So we conclude that all these three markets hold long run equilibrium relationship in the Overall, Pre and Post-SAFTA period. However, cointegration increased in the Post-SAFTA period. So results found a positive evidence that the SAFTA pact increases the cointegration between the capital markets of the South Asian countries. These findings are consistent with the prior studies on the RTAs and capital market integration in the other regions of the world such as Aggarwal and Kyaw (2005) found the positive impact of NAFTA agreement on the integration of NAFTA region; Adjaouté and Danthine (2000) and Hooy and Goh (2007) document increased integration in EU after EU agreement. However, findings of current study contradict to Easterly et al. (2003)

did not find a positive impact of NAFTA on the economic convergence of North American region.

Findings suggest that the trade agreement (SAFTA) increased the capital market integration of the region which is the evidence of positive impact of the trade agreement. It shows that SAFTA removes the barriers to the cross border capital movements resulting in increased foreign investments. Hence the capital is more efficiently allocated and cost of capital is lower. The integrated and well-functioning capital markets result in the enhanced economic growth of the region and have a positive impact on all the economy. The region will benefit in number of ways by these integrated markets, it helps in diversification of risks, reduced information asymmetry and cost to investors; the financial institution will be more competitive and will provide the better service and products; overall it will attract the investors from other parts of the world as well (Irving, 2005).

5. CONCLUSIONS

Regional trade agreements are important for the economic growth and welfare enhancement. South Asian Free Trade Agreement (SAFTA) also have the same objectives such as to remove different trade tariffs and quotas which result in increased imports and exports. This elimination of trade barriers followed by increased regional trade. The present study investigates the impact of SAFTA on capital markets integration of the south Asian region. Weekly data from three representative countries for the period of 1998-2017, divided into two sub periods 1998-2006 (Pre-SAFTA) and 2009-2017(Post-SAFTA) has been examined. The period from 2007-2009 is excluded because of great financial depression. This study documents that the cointegration between the capital markets of South Asia has increased after SAFTA passage. Stock markets of south Asian region move closer to each other as a result of SAFTA. It can also be concluded that SAFTA has a positive impact on the intra-regional trade and markets are closer to each other. It implies that RTAs like SAFTA enhance the linkages between the stock markets, and investors should consider such agreements before making a decision about an investment. The probable rationale behind is that cross border portfolio investments increased significantly between SAARC countries so that it has an incremental impact on the integration of capital markets.

Overall, current study the evidenced that equity markets of South Asia are more integrated after SAFTA agreement that reflects the positive impact of the free trade agreement on the regional capital markets. To further enhance the benefits of SAFTA, it is recommended to synchronize the financial markets infrastructure, strengthen the surveillance mechanisms, and encourage the foreign investors.

Further research is recommended for this region to explore the effectiveness of the SAFTA, its impact on the bilateral FDIs and cross-border portfolio investments.

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