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ABSTRACT

This study attempts to conduct an investigation of the characteristics of the South Asian stock markets including the effects of the opening of these markets. These markets were liberalised in early 1990s as a part of the economic reforms started in the South Asian region about two decades ago. The analysis is conducted for four countries in the South Asia, Bangladesh, India, Pakistan, and Sri Lanka, covering the period from 1980 to 2003. The analysis is done with the help of tables, regression analysis, Event Window analysis, and Error Correction Functions. The analysis indicates significant development in stock markets indicators such as market capitalisation and trading value in the region following liberalisation measures. However, the development in stock markets in South Asia does not seem to influence the real sector and the stock markets are still playing a minor role in their respective economies. The integration analysis suggests that the markets in South Asia are integrated with major markets, that is, of USA, UK, and Japan. There is clear evidence that the markets in India and Pakistan are affected by the major as well as the regional markets in the long run. In the short run, however, the markets appear to be independent of one another.

Keywords: Stock Markets, South Asia, Liberalisation, Pakistan, India, Sri Lanka, Bangladesh, Market Integration

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I. INTRODUCTION

Since 1980s there has been an increasing realisation in the developing countries of the important role of stock markets in economic progress. The inefficiencies in managed economies caused by interventionist economic policies and over reliance on debt financing as well as the tighter lending policies by international creditors forced the developing countries to re-examine their policies and search for alternative strategies. This re-examination resulted in the recognition of a dynamic and competitive private sector and an efficient stock market as the key factors in economic growth [Hartmann and Khambata (1993)]. Consequently, measures were taken to move towards market-based economies and to make the stock market efficient means to stimulate domestic resource mobilisation. These measures, with extensive support from international agencies, particularly, International Finance Corporation (IFC), resulted in remarkable growth in the size and sophistication of equity markets in the developing world, commonly known as Emerging Stock Markets (ESMs).

The most important measure taken in this regard by developing countries was the opening of their respective stock markets to international investors. This step, taken in the late 1980s or early 1990s, resulted in historically high level of portfolio investment in the emerging markets by global and regional funds. The growth in emerging markets is evident from the fact that from 1985 to 1995, the period of stock market liberalisation in many developing countries, the market capitalisation of all emerging markets increased by 1,007 percent compared to an increase of 253 percent in the case of developed markets. As a result, the share of emerging markets in the world market capitalisation increased from 4 percent in 1985 to 11 percent in 1995. Similarly, the trading value in the emerging markets increased by 2,189 percent compared to 564 percent increase for the developed markets over the decade. As a result, the emerging markets share in trading volume increased by more than three times, i.e., from 2.7 percent to 8.9 percent in ten years (Emerging Stock Markets Factbook).

The countries in South Asia followed the same path and took significant steps towards development of their capital markets including the opening of their stock markets to international investors. As a result, the stock markets in these countries showed significant improvements. For example, in Pakistan the market capitalisation (in $) and trading value (in $) increased by 157 percent and 168 percent in the first year of liberalisation. Similarly, the respective increase were 115 percent and 457 percent in the case of Sri Lanka. Moreover, an increase of 133 percent in local index and 172 percent in international index in the case of Pakistan and 118 percent in local index in the case of Sri Lanka made

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these markets to be among the best performing markets in 1991, the initial year of liberalisation in both countries.

This study attempts to conduct an investigation of the characteristics of the South Asian stock markets including the effects of the opening of these markets. The study attempts to present country profile that includes the economic and financial indicators covering both the pre and post liberalisation periods, to examine the impact of liberalisation measures on the stock market such as market capitalisation, trading volume, etc. as well as on the economy like Gross Domestic Product, Investment, etc., and to investigate the integration of these markets among one another as well as with major international capital markets such as stock exchanges of New York, London, Japan, etc.

The study is organised as follows. The next section contains the discussion regarding sample, data, and methodology. Section III presents an overview of stock markets in South Asia followed by the construction of Event Window in Section IV. Section V relates stock market activity to the economic activity in South Asia. Section VI explores the integration of the South Asian markets among themselves as well as with major stock markets of the World. The final section consists of summary and conclusions.

II. DATA, SAMPLE, AND METHODOLOGY

The analysis is conducted for four countries in South Asia; Bangladesh, India, Pakistan, and Sri Lanka. The sample covers the period from 1980 to 2003, which enables the examination of the liberalisation effects particularly, the opening of the market since these markets were opened in early 1990s. The primary data source is Emerging Stock Markets Factbook, previously maintained by IFC. The book is currently published by Standard and Poor and is also re-titled as Global Stock Market Factbook. The supplement sources include World Development Indicators, and Asian Development Outlook.

The analysis is done with the help of tables, graphs, and standard statistical techniques including regression analysis. In addition, Event Window analysis suggested by Henry (2000) is employed. Finally to explore the integration of the South Asian markets we adopt three step methodology. The first step involves the investigation of time series properties of data. Hence, widely used Augmented Dickey Fuller (ADF) test of unit root is applied on all the variables to test for the stationarity of these variables, which determines the order of integration of each variable. The variables having the same order of integration are then tested for Co-integration, the long run relationship, in the second step. The existence of cointegrating relationship is tested with the Likelihood Ratio (LR) test based on both trace and maximum eigenvalue of stochastic matrix as proposed by Johansen (1988). Then Maximum Likelihood Method of Johansen is used to estimate the long run function. In the third step, we estimate the dynamic Error Correction Function.

III. AN OVERVIEW OF STOCK MARKETS

We begin by providing an overview of stock markets in South Asia. Bangladesh has currently two stock exchanges with Dhaka Stock Exchange as the main stock market. The exchange was established in 1954 when Dhaka was the capital of former East Pakistan. After the separation of Eastern wing and the establishment of Bangladesh as an independent country in 1971, the Dhaka Stock Exchange resumed its operation in 1976. In June 1991 foreign investment laws related to listed securities in Bangladesh were relaxed that had a favourable impact on the market.

India is a big country where more than 20 stock exchanges exist. However, the main market is Mumbai Stock Exchange that accounts for about two-third of the trading volume in India. The exchange was established in 1875 when India was under British rule. After gaining independence in 1947, India pursued a highly regulated economy for a long time. In 1985, piecemeal reforms were initiated in industry policy, trade, and finance. The period 1985-91 was the period of partial deregulation in India. In 1991 India moved to market based economy [Vaidya (2003)].

There are currently three stock exchanges operating in Pakistan. However, the main stock market is the Karachi Stock Exchange which was established soon after the creation of Pakistan in 1947. But the market remained inactive until the beginning of 1991 when liberalisation measures, particularly the opening of the market to international investors, were announced. The announcement put a new life in the market and unprecedented bullish trends were observed in the first year. In terms of its performance, the market was ranked third in 1991.

The equity market in Sri Lanka, the Colombo Stock Exchange, has been in operation for more than a century. However, it has not played a significant role for a long time. In 1989 measures were taken to develop capital market and liberalise foreign investment which led to a boom in the stock market. In 1990 and 1991 the Colombo Stock Exchange was considered to be one of the best performing in the World [Ariff and Khalid (2000)].

Table 1 provides some basic information regarding the role of stock markets in South Asian countries.

It is clear from the above analysis that the South Asian region has a long and varying history in equity markets. India and Sri Lanka have more than 100 years old markets whereas in Bangladesh and Pakistan the markets came into existence about 50 years ago. The liberalisation measure, however, took place roughly at the same time, that is, in early 90s. It can be seen that the stock market indicators, Market Capitalisation and Value Traded, which measure the size and activity of a stock market respectively, have improved significantly during the decade of liberalisation. In particular, the improvement in trading activity in Pakistan is phenomenal. However, the proportions of market capitalisation and value traded in GDP in South Asia are still very low indicating small role of stock markets in their respective economy.

Table 1

Stock Markets in South Asia

Countries	Market Established	Market Liberalise	Market Capitalisation (% of GDP) 1990	Market Capitalisation (% of GDP) 2003	Value Traded (% of GDP) 1990	Value Traded (% of GDP) 2003
Bangladesh	1954	1991	1.1	3.1	0.0	0.6
India	1875	1992	12.2	46.5	6.9	47.4
Pakistan	1947	1991	7.1	20.1	0.6	80.9
Sri Lanka	1896	1990	11.4	14.9	0.5	4.2
South Asia			10.8	39.6	5.6	46.4
World			47.8	88.5	28.5	122.8

Source: World Development Indicators 2005.

We now look at the development of stock markets in South Asia, Emerging and World markets covering both the periods before and after liberalisations. Table 2 shows such developments over two decades. The table shows that at the end of 1983 a little over 23,000 companies were listed at the stock markets of the World of which less than 30 percent were listed at the markets of developing nations. A quarter of companies listed at emerging stock markets belong to South Asian countries. Over the two decades, the listed companies grew at the rate of more than 110 percent at the world markets. However, the growth in the case of emerging markets and South Asian markets were more than 275 percent and 300 percent respectively. As a result, the share of emerging markets increased to more than 50 percent whereas the share of South Asian markets in World market increased from 7 percent to 14 percent. This is despite the fact that the listed companies have actually gone down in South Asia during the last five years.

If we look at the size as well as the activity of the market we find that the shares of emerging markets were only around 2 percent in 1983. The shares of South Asian markets were a little over 10 percent in emerging markets but were near to zero in world markets. Over the years however, the market capitalisation increased by 30 times in South Asian and by 43 times in emerging markets. The corresponding increase in World markets was 9 times causing an increase in the share of emerging markets to around 11 percent. However, despite this significant increase the share of South Asian markets is still below 1 percent in world market whereas its share in emerging markets actually decreased to 8 percent. However, the South Asian countries performed much better in the activity. The value traded increased by 138 times in South Asian markets compared to 115 times in emerging and 24 times in World markets. As a result its shares increased to a little over 12 percent in emerging and 1 percent in World markets. If we look at the shares of individual countries in South Asia we

Table 2

Stock Markets in South Asia, Emerging, and World

Countries	1983	1988	1993	1998	2003
	Listed Companies (No.)				
Bangladesh	2.54	3.46	3.58	2.94	3.61
India	68.03	76.69	76.43	82.84	82.56
Pakistan	19.33	13.83	15.30	10.93	10.25
Sri Lanka	10.11	6.03	4.68	3.29	3.57
South Asia	1,692	2,921	4,269	7,074	6,836
Percent of Emg	25.01	27.08	36.94	27.65	26.87
Percent of World	7.22	10.00	14.77	15.46	13.71
Emerging	6,764	10,788	11,557	25,582	25,441
Percent of World	28.86	36.94	40.00	55.91	51.03
World	23,434	29,205	28,895	45,753	49,855
	Market Capitalisation (in $)				
Bangladesh	0.48	1.58	0.40	0.91	0.54
India	84.69	87.65	87.07	92.80	93.03
Pakistan	11.21	9.04	10.31	4.78	5.53
Sri Lanka	3.63	1.73	2.22	1.50	0.90
South Asia	10,049	27,206	112,529	113,345	300,005
Percent of Emg	11.88	7.38	6.76	6.38	8.20
Percent of World	0.30	0.28	0.80	0.42	0.94
Emerging	84,554	368,491	1,664,045	1,775,267	3,656,722
Percent of World	2.51	3.74	11.87	6.59	11.45
World	3,371,298	9,857,059	14,016,925	26,923,830	31,947,703
	Value Traded (in $)				
Bangladesh	0.02	0.03	0.06	0.50	0.09
India	92.84	98.45	90.66	93.62	80.80
Pakistan	7.03	1.42	7.68	5.71	18.89
Sri Lanka	0.12	0.10	1.60	0.18	0.22
South Asia	2,560	12,434	24,023	158,348	352,496
Percent of Emg	10.15	3.06	2.19	6.69	12.17
Percent of World	0.21	0.21	0.33	0.70	1.19
Emerging	25,215	406,272	1,096,098	2,368,356	2,896,144
Percent of World	2.05	6.77	15.24	10.49	9.77
World	1,227,761	5,997,370	7,194,575	22,575,478	29,639,297

Source: Emerging/Global Stock Market Factbook (Various Issues).

see that India dominates the region with more than 90 percent share in market capitalisation and value traded. The remaining belongs to Pakistan leaving almost nothing for the other two countries.

We now look at the stock market indicators for the individual countries in South Asia. We start by looking at the indicators for Bangladesh in Table 3.

Table 3

Stock Market Indicators for Bangladesh (Dhaka Stock Exchange)

Year	Listed Companies (No.)	Market Capitalisation (mill TK.)	Market Capital. (% GDP)	Trading Value (mill TK.)	Turn Over Ratio	Market Capital. (% change)	Trading Value (% change)	DSE (% change)
1980	22	437	0.16					
1981	25	603	0.19			37.99		
1982	28	812	0.22			34.66		
1983	43	1,211	0.30			49.14		
1984	56	2,256	0.46	10	0.4	86.29		
1985	69	3,493	0.62	32	1.1	54.83	220.00	
1986	78	5,731	0.91	48	1.0	64.07	50.00	
1987	85	12,635	1.74	178	1.9	120.47	270.83	109.62
1988	101	13,557	1.69	130	1.0	7.30	26.97	4.16
1989	116	15,351	1.72	174	1.2	13.23	33.85	12.33
1990	134	11,486	1.14	195	1.4	25.18	12.07	25.01
1991	138	10,397	0.94	116	1.1	9.48	40.51	15.54
1992	145	12,299	1.03	438	3.9	18.29	277.59	24.74
1993	153	18,099	1.44	579	3.8	47.16	32.19	6.01
1994	170	41,770	3.08	4,284	14.3	130.79	639.90	115.82
1995	183	53,931	3.54	6,381	13.3	29.11	48.95	1.29
1996	186	193,923	11.66	29,958	24.2	259.58	369.49	175.56
1997	202	69,166	3.83	16,855	12.8	64.33	43.74	67.10
1998	208	48,927	2.44	37,214	63.0	29.26	120.79	28.62
1999	211	44,136	2.01	38,825	83.4	9.79	4.33	9.70
2000	221	64,160	2.71	40,287	74.4	45.37	3.77	31.75
2001	230	65,183	2.57	41,878	64.8	1.59	3.95	4.23
2002	239	69,071	2.54	38,307	57.1	5.96	8.53	2.27
2003	247	95,467	3.18	19,104	23.2	38.22	50.13	14.09

Source: Emerging/Global Stock Markets Factbook (Various Issues).

The table contains information for a little over two decades covering both the pre and post liberalisation periods. The year of liberalisation, shown in bold letters, in the case of Bangladesh was 1991. One can see significant differences in indicators between periods before and after liberalisation. Prior to liberalisation the market showed significant increase in 1987 by registering a gain of 110 percent in local index. Moreover, the trading value and market capitalisation increased by 271 percent and 120 percent. However after that the market went on a falling trend. The trend continued even in the year of liberalisation. It seems that the real response to liberalisation measures came after three years in 1994. In particular the trading activity increased by 640 percent causing the turnover ratio to increase from 3.8 to 14.3. Then the market reacted extraordinary in 1996 by registering a gain of 176 percent in local index. In particular, the market capitalisation increased from Tk.54 billion to Tk.194 billion causing its ratio in GDP to increase from 3.5 to 11.7. However, the market immediately reverted back in the following periods. One can see a marked difference in turnover ratio between the pre and post liberalisation periods although it went down from 83.4 in 1999 to 23.2 in 2003. The ratio of market capitalisation ranges between 2 percent to 3 percent indicating a marginal role of stock market in Bangladesh economy.

We now proceed to look at the stock market indicators for India shown in Table 4. It is interesting to note that India ranks first in the world in terms of listed companies. USA with 5,295 companies occupies the second place. However it ranks at 17th and 16th place in terms of market capitalisation and trading value respectively. Although the measures to liberalise the economy started in 1991, the year of stock market liberalisation, used in most studies, is 1992. The table shows that significant developments in Mumbai Stock

Table 4

Stock Market Indicators for India (Mumbai Stock Exchange)

Year	Listed Companies (No.)	Market Capitalisation (mill Rs)	Market Capital. (% GDP)	Trading Value (mill Rs)	Turn Over Ratio	Market Capital. (% change)	Trading Value (% change)	BSE (% change)
1980	992	60,147	4.18	21,700	40.3			
1981	1,031	107,389	6.37	63,950	76.3	78.54	194.70	41.75
1982	1,106	110,761	5.88	47,560	43.6	3.14	25.63	4.74
1983	1,151	89,300	4.07	24,010	24.0	19.38	49.52	9.53
1984	1,295	99,840	4.07	44,500	47.1	11.80	85.34	9.30
1985	1,529	174,750	6.29	61,340	44.7	75.03	37.84	98.40
1986	1,912	178,300	5.73	135,960	77.0	2.03	121.65	7.16
1987	2,095	219,870	6.21	87,400	43.9	23.31	35.72	8.22
1988	2,240	354,820	8.42	170,035	59.2	61.38	94.55	62.73
1989	2,407	460,000	9.46	280,320	68.8	29.64	64.86	32.37
1990	2,435	700,000	12.31	382,091	65.9	52.17	36.31	24.80
1991	2,556	1,231,440	18.85	548,350	56.8	75.92	43.51	82.09
1992	2,781	1,867,610	24.96	572,723	37.0	51.66	4.44	37.01
1993	3,263	3,050,000	35.50	675,152	27.5	63.31	17.88	27.94
1994	4,413	4,000,000	39.50	851,360	24.2	31.15	26.10	17.36
1995	5,398	4,472,970	37.65	445,764	10.5	11.82	-47.64	20.79
1996	5,999	4,392,310	32.10	940,672	21.2	1.80	111.02	0.81
1997	5,843	5,037,160	33.08	1,959,540	41.6	14.68	108.31	18.60
1998	5,860	4,770,100	27.40	2,661,856	56.0	5.30	35.84	16.50
1999	5,842	8,033,530	41.48	5,279,606	84.4	68.41	98.34	63.83
2000	5,853	6,911,619	33.08	10,000,550	135.8	13.97	89.42	20.65
2001	5,795	5,323,280	23.33	4,752,790	79.7	22.98	52.47	17.87
2002	5,650	6,281,974	25.44	3,329,090	59.4	18.01	29.96	3.52
2003	5,644	12,733,610	45.93	4,093,730	45.1	102.70	22.97	72.89

Source: Emerging/Global Stock Markets Factbook (Various Issues).

Exchange started much earlier than liberalisation year. In 1985, the first year of partial deregulation, the market registered a gain of almost 100 percent in local index. The IFC return index was 105 percent. Moreover, the market capitalisation increased by 80 percent.

In the next year, the trading activity increased by more than 120 percent causing an increase in turnover ratio from 45 percent to 77 percent. The significant impact of liberalisation appeared to be in the ratio of market capitalisation to GDP which was below 10 percent until three years prior to liberalisation, increased to 25 percent in the year of liberalisation, remained around 35 percent in the next five years and finally jumped to 46 percent in 2003. In this year, the market capitalisation increased by more than 100 percent. In addition, the local indexes BSE and CNX went up 73 percent and 98 percent respectively whereas the IFC return index increased by 99 percent. Another impact relates to the deepening of the market in terms of listing which was more than doubled in four years and reached to almost 6,000. However the listing started falling after that and ended at 5644.

Next we look at the stock market indicators for Pakistan, shown in Table 5.

Table 5

Stock Market Indicators for Pakistan (Karachi Stock Exchange)

Year	Listed Companies (No.)	Market Capitalisation (mill Rs.)	Market Capital. (% GDP)	Trading Value (mill Rs.)	Turn Over Ratio	Market Capital. (% change)	Trading Value (% change)	SBGI (% change)
1980	314	6,361	2.71					
1981	311	8,554	3.07			34.48		5.74
1982	326	11,267	3.48			31.72		15.49
1983	327	15,201	4.17			34.92		29.18
1984	347	18,834	4.49	2,523	14.8	23.90		13.49
1985	362	21,900	4.64	3,757	18.4	16.28	48.91	1.07
1986	361	29,491	5.73	2,583	10.0	34.66	31.24	20.06
1987	379	34,300	5.99	2,813	8.8	16.31	8.90	14.26
1988	404	45,508	6.74	3,181	8.0	32.68	13.05	15.02
1989	440	52,207	6.78	3,910	8.0	14.72	22.94	5.56
1990	487	61,900	7.23	4,979	8.7	18.57	27.34	11.25
1991	542	180,222	17.73	15,232	12.6	191.15	205.91	132.80
1992	628	204,723	16.99	24,435	12.7	13.60	60.42	11.24
1993	653	347,829	26.09	51,579	18.7	69.90	111.09	42.40
1994	724	377,333	24.17	97,472	26.9	8.48	88.98	0.73
1995	764	317,732	17.03	101,446	29.2	15.80	4.08	18.21
1996	782	426,400	20.11	218,210	58.6	34.20	115.10	27.40
1997	781	482,555	19.87	471,339	103.7	13.17	116.00	0.28
1998	773	265,624	9.92	427,444	114.3	44.95	9.31	29.97
1999	765	361,293	12.30	1,081,970	345.2	36.02	153.13	22.59
2000	762	379,087	12.05	1,760,090	475.5	4.93	62.67	5.77
2001	747	296,144	8.65	765,606	226.8	21.88	56.50	20.17
2002	712	595,206	16.40	1,542,996	346.2	100.99	101.54	70.72
2003	701	951,447	23.68	3,846,378	497.4	59.85	149.28	60.92

Source: Emerging/Global Stock Markets Factbook (Various Issues).

The table indicates that there was not much movement in the market before its opening in early 1991. The market responded positively to liberalisation measure and unprecedented trends were observed in the first year of the opening of the market. The market capitalisation and trading value went up by three times. Further, the local index increased by 133 percent while the increase in international index, IFC return, was 172 percent. In terms of its performance the market was ranked third after Argentina and Columbia in 1991.

It appears, however that the market overreacted in the first year of opening as it went down in the following year by 11 percent and 18 percent in terms of local and IFC indexes respectively. Nevertheless the market deepened in terms of listings and 86 new companies were listed during the year that helped in increasing the turnover of shares and market capitalisation. Though the market, in general, had a downward trend in the 90s it improved significantly in terms of size and activity. As a result, the ratio of market capitalisation to GDP increased from 7 percent to almost 18 percent in the first year of liberalisation and further to 26 percent after two years. After considerable fluctuations it ended at 23.7 percent in 2003. On the other hand, the growth in activity indicated by trading value and turnover ratio was tremendous. Since late 90s the turnover ratio has been phenomenal and increased to almost 500 percent in 2003. As a result Pakistan ranks first in the world in terms of turnover ratio. It has been among the best performing markets for the last two years.

Finally we look at the stock market indicators for Sri Lanka, shown in Table 6. We could not get the data for the period of early 80s. As mentioned above Sri Lanka has one of the oldest stock exchanges in the world. However, it remained dormant until the year of liberalisation. The market capitalisation increased by almost 116 percent whereas trading value by more than 500 percent. The increase in local index was almost 114 percent. The trend continued in the following year and the market registered a gain of almost 118 percent accompanied by more than 100 percent increase in market capitalisation and trading value. As a result the ratio of market capitalisation to GDP increased from less than 7 percent in 1989 to more than 11 percent in 1990 and further to 22 percent in 1991. Similarly, the turnover ratio increased from 1.6 to 5.8 to 7.2. Then in 1993 the ratios of capitalisation to GDP and turnover reached to 25 percent and 20 percent respectively. These significant developments caused the market to be among the best performing in 1990 and 1991. It can be seen that in the other half of the 90s the market did not do well. However, the indicators improved significantly in the last two years.

Table 6

Stock Market Indicators for Sri Lanka (Colombo Stock Exchange)

Year	Listed Companies (No.)	Market Capitalisa-tion (mill Rs)	Market Capital. (% GDP)	Trading Value (mill Rs)	Turn Over Ratio	Market Capital. (% change)	Trading Value (% change)	CSE (% change)
1980								
1981								
1982								
1983								
1984								
1985	171	10,000	6.16	72				
1986	171	12,000	6.69	144	1.2	20.00	100.00	15.80
1987	168	18,700	9.51	335	2.2	55.83	132.64	15.66
1988	176	15,500	6.98	380	2.2	17.11	13.43	38.10
1989	176	17,087	6.78	256	1.6	10.24	32.63	9.29
1990	175	36,880	11.46	1,563	5.8	115.84	510.55	113.80
1991	178	82,700	22.21	4,302	7.2	124.24	175.24	117.96
1992	190	66,200	15.57	4,969	6.7	19.95	15.50	27.75
1993	200	123,790	24.78	18,579	19.6	86.99	273.90	61.74
1994	215	143,213	24.73	34,522	25.9	15.69	85.81	0.79
1995	226	106,869	16.00	11,249	9.0	25.38	67.41	32.74
1996	235	104,848	13.65	7,403	7.0	1.89	34.19	9.15
1997	239	129,428	14.54	18,314	15.6	23.44	147.39	16.45
1998	233	116,665	11.46	18,207	14.8	9.86	0.58	14.94
1999	239	112,783	10.20	14,843	12.9	3.33	18.48	4.15
2000	239	88,831	7.06	11,049	11.0	21.24	25.56	21.82
2001	238	124,045	8.81	14,057	13.2	39.64	27.22	38.74
2002	238	162,588	10.27	30,523	21.3	31.07	117.14	31.26
2003	244	262,838	14.93	73,838	34.7	61.66	141.91	30.30

Source: Emerging/Global Stock Markets Factbook (Various Issues).

IV. EVENT WINDOW ANALYSIS

In this section we examine the stock market development through Event Window Analysis that works as follows. Suppose the government announces in the month T*-3 that it will open the stock market to foreign investors in month T*. Since there is no anticipated price jumps, the price must jump on the announcement and then gradually appreciate in such a way that there is no jump in price when actual liberalisation occurs at T*.

We follow Henry (2000) methodology when constructing liberalisation dummy variables. Following this methodology we construct liberalisation event window indicating dummy variable Liberalisation. This dummy is given value of one during T*-7 months, that is for eights moths, where the T* is the month of liberalisation and 0 otherwise. T* is the month in which any one of the following occurs.

The impact of liberalisation on the stock market returns during the liberalisation window is evaluated by estimating the following equation;

$$Rt = \alpha + \beta\ Liberalizet + \varepsilon t$$

Liberalisation is a dummy variable that takes on the value one in each months from T*-7 to T* with respect to the specified first stock market liberalisation. Therefore the parameter β measures the average monthly abnormal returns during the eight month stock market liberalisation window.

Table 7

Stock Market Revaluation Proceeding to Stock Market Liberalisation

Country	Intercept	Liberalise	R2	LogLik
Pakistan (OLS)	0.00664	0.13997*	0.07891	445.16869
India (OLS)	0.0001835	0.05287	0.00719	128.185
GARCH(1, 1)	0.0174806	0.04385*		140.123508
Sri Lanka (OLS)	0.006271	0.04904		
GARCH(1, 1)	0.00627072	0.00627*		169.600032

Note: *Indicate level of significance at 5 percent.

The results from the estimated equation are given in Table 7. The residual from the estimated equation for Pakistan passed diagnostic test where as estimated equation for India and Sri Lanka have ARCH in the residual. Therefore, we reported results OLS for Pakistan and OLS and GARCH(p, q) model for India and Sri Lanka. The estimated coefficients of liberalisation for Pakistan, India and Sri Lanka, from respective equations, are 0.139, 0.043 and 0.006, respectively. It implies that on average the stock markets of Pakistan, India and Sri Lanka are preceded by a total revaluation of 111 percent, 35 percent and 5 percent, respectively. The revaluation of respective country is calculated by multiplying the average monthly abnormal return during the window by the length of window that is 8 months.

In the second step, following Henry (2000) and Jaysuriya (2002) among others, we used another liberalisation dummy (LibT) which takes the value of one at the moth of liberalisation and zero otherwise. The estimated coefficient of this dummy variable gives the abnormal gain in the market return of the country during the moth of liberalisation. The results are presented in the following Table 8.

Table 8

Stock Market Reaction to Stock Market Liberalisation

Country	Constant	LIBT*-7	LIBT*	R2	LLR
Pakistan	0.0075	0.175*	0.291*	0.116	196.59
India	0.0021	0.0421	0.104	0.0116	103.991
Sri Lanka	0.0082	0.0166	0.0587	0.00287	168.64
ARCH(1)	0.0082	0.01675	0.0587*		168.640781

Note: *Indicate level of significance at 5 percent.

As may be seen from the Table 8, the variable representing liberalisation window preceding the liberalisation date, LIBT*-7 is statistically significant only in the case of Pakistan. For other countries it is not significantly different from zero. The impact of liberalisation event is captured by LibT dummy variable. The estimated parameters for Pakistan and Sri Lanka are significant at conventional level. The sign of the estimated parameter, however, is negative. Whereas, in case of India, the stock market seems to be insensitive to the event of liberalisation.

Third step toward estimating the impact of liberalisation is to construct policy shift dummy (LIB). This dummy variable takes the value one after the stock market liberalisation and zero before the policy change. This dummy is assumed to capture long run effect of liberalisation on the stock market returns. The results are presented in the Table 9 below.

Table 9

Post- and Pre-Liberalisation Impacts of Liberalisation on Stock Market Returns

Country	Constant	LIBT*-7	LIBT*	LIB	R2	LL
Pakistan	0.0133	0.1697*	0.282*	0.0086	0.1183	188.198
India	0.001962	0.0381	0.107	0.00279	0.0105	134.075
GARCH(1,1)	0.03577	0.0121	0.1599*	0.0401**		156.693
Sri Lanka	0.0338*	0.00899	0.0266	0.0321**	0.0235	170.375
GARCH(1,1)	0.0299**	0.00667	0.02998	0.0284		169.677

Note: *Indicate level of significance at 5 percent. **Indicate level of significance at 10 percent.

The analysis leads us to conclude that liberalisation of stock markets in the South Asia have diversified impact on the countries. Pakistan is the only country which significant revaluation, that is on average 13 to 17 percent per month. The stock markets of other countries which are included in the analysis did not show any revaluation preceding the liberalisation. Second the month when the liberalisation programme actually implemented has significant impact on the stock markets of Pakistan and India. But both markets reacted in opposite direction.

V. AN OVERVIEW OF THE ECONOMIES IN SOUTH ASIA

Having seen the developments of the stock markets in South Asian countries we now proceed to see the economic situation of these countries and look at the macroeconomic indicators for the same periods. The indicators include growth in real variables like GDP, Per Capita, and Investment, besides Inflation Rate and Monetary Expansion. In addition, indicators like Savings, Investment as well as balances in budget and current accounts are shown as a percent of GDP. The analysis also shows the averages with standard deviations for the pre and post liberalisation periods. The year of liberalisation shown in bold letters is not included in averages.

Once again we start by looking at the indicators for Bangladesh shown in Table 10.

Table 10

Macroeconomic Indicators for Bangladesh

	Growth (% per Annum)					(as a % of GDP)			
Years	Real GDP	Real Per Capita	Real Invest.	GDP Deflator	Money (M2)	Savings	Invest.	Budget Balance	Current Account
1981	3.8	1.2	3.1	10.5	19.6	8.4	17.6	7.6	7.8
1982	2.4	0.2	8.1	9.7	18.7	7.1	17.8	7.7	5.5
1983	4.0	1.4	5.1	8.5	41.9	7.6	17.0	4.8	0.5
1984	5.2	2.5	9.6	14.0	30.4	6.2	15.9	7.4	3.9
1985	3.2	0.6	6.0	11.1	30.9	8.6	16.3	6.1	3.1
1986	4.2	1.6	6.7	8.0	12.4	9.8	16.7	6.9	4.1
1987	3.7	1.1	8.2	10.9	22.0	9.1	16.0	8.5	1.4
1988	2.2	0.4	6.1	7.6	9.1	9.2	16.3	7.1	1.5
1989	2.6	0.1	7.0	8.5	16.3	9.2	16.7	7.1	5.4
1990	5.9	3.4	6.3	6.3	16.9	9.6	17.1	7.4	2.0
1991	3.3	1.5	1.4	6.6	12.1	11.3	16.9	6.5	0.3
1992	5.0	3.2	4.4	3.0	14.1	12.5	17.3	4.7	0.7
1993	4.6	2.8	9.5	0.3	10.6	12.9	17.9	5.4	1.4
1994	4.1	2.3	9.4	3.8	18.6	13.5	18.4	4.5	0.3
1995	4.9	3.1	9.1	7.3	13.0	12.6	19.1	5.4	1.8
1996	4.6	2.8	10.6	4.2	8.3	12.4	20.0	0.9	3.3
1997	5.4	3.6	11.1	3.1	10.8	14.7	20.7	4.5	2.2
1998	5.2	3.4	12.1	5.3	10.2	16.7	21.6	4.1	1.3
1999	4.9	3.1	9.9	4.7	12.8	16.7	22.2	4.8	1.5
2000	5.9	4.1	7.3	1.9	18.6	17.8	23.0	6.2	1.1
2001	5.3	3.5	5.8	1.6	16.6	17.0	23.1	5.0	2.3
2002	4.4	2.6	8.2	3.2	13.1	18.4	23.1	4.6	0.4
2003	5.3	3.3	7.9	4.5	13.1	17.6	23.4	4.2	0.3
AVG (1981-90)	3.7	1.1	6.6	9.5	21.8	8.5	16.7	7.1	3.5
STD (1981-90)	1.2	1.2	1.8	2.2	9.9	1.2	0.6	1.0	2.3
AVG (1992-03)	4.9	3.1	8.8	3.5	13.3	15.0	20.6	4.4	-1.0
STD (1992-02)	0.5	0.5	2.3	1.9	3.4	2.3	2.2	1.8	1.4

Source: World Development Indicators.

The table shows a significant improvement in the economy after liberalisation measures. All the indicators, on average, improved in the post liberalisation periods. The growth rates in real variables, particularly Per Capita, increased in periods after liberalisation. This is accompanied by considerable decrease in inflation and monetary expansion. Similarly, both the deficits, budget and current account, decreased significantly in the post liberalisation Period. In addition, during the decade of liberalisation the saving to GDP ratio has almost doubled whereas the proportion of investment in GDP also increased. It is notable that the growth in real variables fell significantly in the year of liberalisation. However, recovery started immediately in the following year. The growths in real investment were in the double digit in the second half of the 90s that did not continue later on. In general, the indicators showed less fluctuation in post liberalisation periods indicating stable performance.

We now proceed to look at the macroeconomic indicators for India presented in Table 11. It can be seen that the behaviour of the economy in India is similar to the one in Bangladesh, that is, an improvement after liberalisation

Table 11

Macroeconomic Indicators for India

	Growth (% per Annum)					(as a % of GDP)			
Years	Real GDP	Real Per Capita	Real Invest.	GDP Deflator	Money (M2)	Savings	Invest.	Budget Balance	Current Account
1981	6.4	4.0	7.6	10.3	16.9	19.7	22.4	3.5	1.5
1982	3.7	1.4	2.7	7.7	16.8	19.4	21.7	5.0	1.3
1983	7.1	4.8	4.8	8.9	16.8	17.6	19.7	3.5	1.0
1984	4.1	2.0	5.6	7.4	18.0	20.1	21.6	4.3	1.2
1985	5.6	3.5	6.1	7.2	17.0	21.2	23.7	4.7	2.0
1986	4.8	2.6	5.5	6.8	18.1	21.3	23.2	5.6	2.0
1987	4.3	2.1	9.1	9.2	15.8	20.7	22.1	8.1	2.0
1988	9.9	7.6	8.1	8.3	17.6	22.2	23.7	7.8	2.6
1989	6.4	4.3	7.1	8.3	19.6	22.5	23.7	7.9	2.5
1990	5.8	3.7	8.7	10.5	15.1	22.6	24.1	8.3	3.2
1991	0.9	1.1	1.7	13.8	19.3	21.9	21.9	5.9	0.4
1992	5.3	3.3	4.2	8.8	15.7	23.0	23.8	5.7	1.3
1993	4.9	2.9	5.6	9.5	18.4	21.3	21.3	7.5	0.1
1994	7.5	5.5	11.8	9.7	22.3	23.1	23.4	0.1	1.1
1995	7.6	5.7	19.3	9.0	13.7	25.3	26.5	1.0	1.7
1996	7.4	5.5	1.5	7.2	15.2	20.6	21.8	1.2	1.5
1997	4.5	2.7	2.1	6.5	18.0	21.3	22.6	4.8	1.3
1998	6.0	4.2	8.7	7.9	19.4	19.7	21.4		1.0
1999	7.1	5.3	8.6	3.8	14.6	21.7	23.7	5.4	1.1
2000	3.9	2.2	4.7	3.8	16.8	21.9	22.7	5.6	0.8
2001	5.2	3.5	4.4	3.9	14.1	21.7	22.3	5.9	0.2
2002	4.6	3.0	9.4	3.5	15.1	22.5	22.8	5.5	1.3
2003	8.3	6.7	14.7	3.2	13.0	26.0	25.3	4.5	2.3
AVG (1981-91)	5.4	3.2	5.8	9.0	17.4	20.9	22.5	5.9	1.8
STD (1981-91)	2.3	2.2	3.1	2.0	1.4	1.5	1.3	1.9	0.8
AVG (1993-03)	5.9	4.1	7.6	6.5	16.8	21.9	22.8	4.1	0.7
STD (1993-03)	1.4	1.4	5.3	2.5	2.8	1.5	1.5	2.6	0.8

Source: World Development Indicators.

measures. In fact, the economy showed its best performance in the mid of 90s, periods just after liberalisation measures, with an average growth rate of 7.5 in GDP and 5.5 in Per Capita and marginal share of fiscal deficit in GDP. In recent years, however, the share has been increased to around 5 percent accompanied by a marginal increase in the current account that seemed to be in balance two years ago. The real investment showed a much higher response to liberalisation in the initial years but lost its momentum after wards. Overall, the economy showed an improved and stable performance in the post liberalisation period. In particular, the economy showed remarkable performance in 2003.

Next, we look at the macroeconomic indicators for Pakistan, shown in Table 12. It can be seen that in contrast to Bangladesh and India the indicators for Pakistan show a general deterioration in the economy. The economy was

Table 12

Macroeconomic Indicators for Pakistan

	Growth (% per Annum)					(as a % of GDP)			
Years	Real GDP	Real Per Capita	Real Invest.	GDP Deflator	Money (M2)	Savings	Invest.	Budget Balance	Current Account
1981	7.9	4.9	20.5	9.9	11.6	8.1	18.8	6.1	3.3
1982	6.5	3.7	19.5	9.4	21.7	7.4	19.3	5.9	3.0
1983	6.8	3.9	9.7	5.3	21.0	7.7	18.8	6.9	0.1
1984	5.1	2.3	12.0	9.7	4.6	6.7	18.3	6.0	4.0
1985	7.6	4.7	12.8	4.5	14.7	5.9	18.3	7.8	4.8
1986	5.5	2.7	11.7	3.3	14.8	8.0	18.8	8.1	2.3
1987	6.5	3.7	13.4	4.5	13.7	11.4	19.1	8.2	1.7
1988	7.6	4.8	11.1	9.6	12.2	9.9	18.0	8.5	3.8
1989	5.0	2.3	19.6	8.6	4.6	11.0	18.9	7.4	3.6
1990	4.5	1.8	11.3	6.5	12.6	11.1	18.9	6.5	4.1
1991	5.1	2.4	19.4	13.1	16.3	17.5	19.0	8.7	3.1
1992	7.7	5.0	26.1	10.1	30.3	17.1	20.2	7.4	3.8
1993	1.8	0.8	13.8	8.7	18.0	14.7	20.8	8.0	5.7
1994	3.7	1.2	10.0	12.9	18.1	16.8	19.5	5.9	3.8
1995	5.0	2.4	13.4	13.9	17.2	15.8	18.5	5.6	3.5
1996	4.8	2.3	16.4	8.4	13.8	14.5	19.0	7.0	6.8
1997	1.0	1.4	8.0	13.4	12.2	13.2	17.9	6.3	5.6
1998	2.6	0.1	9.0	7.5	14.5	16.7	17.7	7.6	2.7
1999	3.7	1.2	3.6	5.9	6.2	14.0	15.6	6.1	3.0
2000	4.3	1.8	10.2	2.7	9.4	14.4	16.0	6.6	0.4
2001	2.6	0.1	5.5	6.1	9.0	14.2	15.5	5.2	0.6
2002	2.8	0.4	0.4	3.1	15.4	14.4	14.7	5.2	4.6
2003	5.0	2.5	6.3	4.4	17.5	17.5	16.9	4.5	4.3
AVG (1981-90)	6.3	3.5	14.2	7.1	13.2	8.7	18.7	7.1	3.1
STD (1981-90)	1.2	1.1	4.1	2.6	5.7	2.0	0.4	1.0	1.4
AVG (1992-03)	3.6	1.1	9.9	8.4	14.9	15.1	17.8	6.4	2.7
STD (1992-03)	1.8	1.8	7.9	3.9	6.4	1.3	2.1	1.0	3.3

Source: World Development Indicators.

growing at an average of 6.3, the highest in the region, in the pre liberalisation period that declined nearly half to 3.6, the lowest in the region, in the post liberalisation period. Real per capita declined to more than one third and above all real investment declined by more than 30 percent. The decline in real variables may also be attributed to a significant jump in the inflation rate that became more than doubled in the year of liberalisation and remained in double digit in the first half of the decade of liberalisation.

A closer look at the table reveals that the economy in fact improved in the initial years of liberalisation. In particular, growth in real investment increased to almost 20 percent in the year of liberalisation and further to more than 25 percent in the following year and remained in double digit in the first half. However, the economy seems to be adversely affected by the political instability in the country. A series of changes in governments in the 90s shattered investor s confidence that proved detrimental to the economy. The improvements in the economy include a significant increase in the proportion of saving and decline in the deficits. In particular, the fiscal deficit, which was as high as 8.7 percent of GDP in the year of liberalisation, decreased to 4.5 percent after a decade of liberalisation.

Finally we look at the indicators for Sri Lanka shown in Table 13.

It can be seen that following Bangladesh and India the economy of Sri Lanka improved in the periods after liberalisation. In fact the economy showed its best performance in the year of liberalisation with growth rates of over 6 percent in real GDP and 5 percent in real per capita whereas the real investment grew by almost 33 percent. This was accompanied by significant decline in deficits particularly current account.

Another way of analysing the impacts of stock market development on the real sector of the economy is by regressing real variables on stock market variables. For this purpose we regress the real variables, GDP and Investment on a stock market variable, Market Capitalisation. The results are shown in Table 14.

The regressions consist of three models. Model I tests the impact of Market Capitalisation on real variables. Model II includes an intercept dummy for stock market liberalisation whereas Model III also includes a slope dummy. It can be seen from the table that Market Capitalisation is not significant any where. Further the dummies are also not significant in the case of Investment indicating that real investment in South Asian region is unaffected by the increase in market capitalisation as well as by the stock market liberalisations. Similarly real GDP is unaffected by the stock market development in India and Sri Lanka. The intercept dummies are significant in Bangladesh and Pakistan indicating that real GDP changed significantly in these countries after stock market liberalisation. The change is adverse in the case of Pakistan but as mentioned above this is mainly because of political instability.

Table 13

Macroeconomic Indicators for Sri Lanka

Years	Growth (% per Annum)					(as a % of GDP)			
	Real GDP	Real Per Capita	Real Invest.	GDP Deflator	Money (M2)	Savings	Invest.	Budget Balance	Current Account
1981	5.7	4.3	5.4	20.9	23.1	11.7	27.8	15.7	10.1
1982	4.1	2.8	29.2	12.1	24.8	11.9	30.8	17.9	11.7
1983	4.8	3.6	15.1	16.9	22.1	13.8	28.9	13.9	9.2
1984	5.1	4.0	13.0	20.3	16.6	20.2	25.8	9.5	0.0
1985	5.0	4.0	-9.3	0.6	11.5	10.2	22.2	21.9	7.2
1986	4.4	3.3	17.8	5.9	5.1	12.1	23.7	11.4	6.9
1987	1.7	0.7	8.1	7.8	14.7	13.2	23.3	11.1	4.9
1988	2.5	1.5	10.2	10.1	16.5	12.0	22.8	15.7	5.6
1989	2.3	1.3	8.2	10.9	12.5	11.5	21.7	11.4	6.0
1990	6.4	5.3	32.7	20.1	19.1	13.8	22.6	9.7	3.7
1991	4.6	3.4	17.2	10.6	23.2	13.9	22.9	11.7	6.7
1992	4.4	3.3	21.2	9.4	16.6	15.0	24.3	7.4	4.7
1993	6.9	5.5	23.7	9.9	23.5	16.0	25.6	8.4	3.7
1994	5.6	4.1	22.6	9.8	19.7	15.2	27.0	10.5	7.3
1995	5.5	4.4	9.8	9.3	19.2	15.3	25.7	10.1	6.0
1996	3.8	2.6	8.4	10.8	10.8	15.3	24.2	9.4	4.9
1997	6.4	5.1	16.6	8.9	13.8	17.3	24.4	7.9	2.6
1998	4.7	3.3	17.9	9.2	13.2	19.1	25.1	9.2	1.4
1999	4.3	2.7	18.0	4.2	13.4	19.5	27.3	7.5	3.6
2000	6.0	4.5	16.3	7.3	12.9	17.3	27.9	9.9	6.4
2001	-1.5	-2.9	-11.8	13.7	13.6	15.8	22.0	10.8	1.5
2002	4.0	2.7	7.7	8.3	13.4	14.3	21.0	8.9	1.6
2003	6.0	4.7	16.0	5.0	15.3	15.9	22.1	8.2	1.6
AVG (1981-89)	4.0	2.8	10.9	11.7	16.3	13.0	25.2	14.3	6.8
STD (1981-89)	1.4	1.3	10.3	6.7	6.3	2.9	3.3	4.0	3.4
AVG (1991-03)	4.6	3.2	14.0	9.3	16.1	16.2	24.8	9.3	4.2
STD (1991-03)	2.2	2.2	9.7	2.2	4.3	1.8	2.1	1.4	2.1

Table 14

Impact of Changes in Market Capitalisation on Growth in Real Variables

	GDP Growth			Investment Growth		
	Model I	Model II	Model III	Model I	Model II	Model III
Bangladesh						
Const.	4.3865***	3.7824***	3.6740***	7.2125***	6.2594***	5.5851***
MCAP	0.0018	0.0012	0.0012	0.007	0.0079	0.0171
D		1.0686**	1.1937**		1.6859	2.157
D*MCAP			0.0029			0.011
India						
Const.	5.5334***	5.2219***	5.3253***	6.4779***	5.4755***	5.7479***
MCAP	0.0019	0.0039	0.001	0.0021	0.0085	0.0009
D		0.5126	0.3387		1.6495	1.1914
D*MCAP			0.0065			0.0171
Pakistan						
Const.	4.8486***	6.1896***	4.8172***	11.8403***	13.7023***	14.6493*
MCAP	0.0018	0.0039	0.057	0.015	0.0179	0.0188
D		2.5692***	1.1706		3.5672	4.5324
D*MCAP			0.054			0.0372
Sri Lanka						
Const.	4.1115***	2.6646**	2.8551*	13.0565***	10.2189*	11.3657*
MCAP	0.0046	0.0029	0.0081	0.0533	0.0499	0.0166
D		1.9486	1.7321		3.8216	2.5182
D*MCAP			0.012			0.0722

Note: *Indicates level of significance at 5 percent. **Indicate level of significance at 10 percent. ***Indicate level of significance at 15 percent.

VI. SUMMARY AND CONCLUSIONS

This study attempts to conduct an investigation of the characteristics of the South Asian stock markets including the effects of the opening of these markets. These markets were liberalised in early 1990s as a part of the economic reforms started in South Asian region about two decades ago. The analysis is conducted for four countries in South Asia, Bangladesh, India, Pakistan, and Sri Lanka covering the period from 1980 to 2003. The data sources include Emerging/Global Stock Market Factbook, with International Financial Statistics, World Development Indicators, and Asian Development Outlook as supplements. The analysis is done with the help of tables, regression analysis, Event Window analysis, and Error Correction Functions.

We present country profile that includes the economic and financial indicators covering both the pre and post liberalisation periods. Further we examine the impact of liberalisation measures on the stock market such as market capitalisation, trading volume, etc. as well as on the economy like Gross

Domestic Product, Investment, etc. Moreover, we investigate the integration of these markets among one another as well as with major international capital markets such as stock exchanges of New York, London, Japan, etc.

The analysis indicates significant development in stock markets in the region following liberalisation measure. The stock market indicators such as market capitalisation and trading value increased by many times. However, the significant development in stock markets in South Asia do not seem to influence the real sector and the stock markets are still playing a minor role in their respective economies. The integration analysis suggests that the markets in South Asia are integrated with major markets, that is, of USA, UK, and Japan. There is clear evidence that the markets in India and Pakistan are affected by the major as well as by the regional markets in the long run. In the short run, however, the markets appear to be independent of one another.

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