

Does History (Financial) Repeat Itself? An Evaluation of Price Manipulation and Volatility in Two Emerging Markets in Asia

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Introduction

It is fairly well known that many emerging markets, like China, India and Pakistan, have witnessed tremendous real economic growth varying between 6% and 11% in the last decade. Consequently, by and large, the emerging markets have been spectacular places to invest in the recent past, though their current valuations, volatility and hints of market manipulation and speculative trading pose additional risks. One particular form of systemic risk in the emerging markets arises from a lack of trust in the fairness of markets due to potential for manipulation, highlighted by recurring scandals and scams, which may exacerbates the market volatility. The regulatory agencies respond by evolving legal framework in an effort to restore the investors' confidence in the markets and institutions.

In this study we describe the interplay of regulatory adaptation and market forces in two emerging markets in South Asia, namely, India and Pakistan, which lend themselves especially for comparative analysis due to commonalities in institutional structures and traditional financial instruments and practices. The two markets share a common genesis, a common civil code, and similar cultural and regulatory environment. In recent times the two markets have had their own cycles of boom and bust, periods of superlative growth as well as of sharp decline and volatility. We draw comparisons between the regulatory response to financial scandals, speculation and volatility and its effectiveness in achieving declared objectives regarding market. We study episodes of speculative market behavior and regulatory response in India and Pakistan; two episodes in the former and one in the later. In these periods allegations of massive speculation, manipulation and scandals led to political pressures on the regulators to phase out a traditional institution common to the two countries, that is, of "*badla*" or Carry-Over-Trade (COT) financing, which is explained in the following section. In section III we provide a brief description of the speculative episodes and the regulatory response in the two countries. Section IV explains the empirical methodology we use to examine the change in the market behavior following regulatory changes. Section V presents summary and conclusions.

Institutional Background

Bombay Stock Exchange is the oldest stock exchange in Asia having been established in 1875. Over 3,500 stocks with a total market capitalization of about US \$ 466 billion are traded on the exchange. The BSE is among the 5 biggest stock exchanges in the world in terms of transactions volume. Along with the National Stock Exchange (NSE), an emerging

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competitor established in 1994, the two exchanges represent more than four-fifth share in aggregate turnover of the 23 stock exchanges in the country.

Following the economic reforms of July 1991, Indian stock markets have been increasingly integrated with developed markets. Their exposure to the fluctuations in global stock markets has increased as foreign institutional investors have become influential players in the domestic markets since 1993. Over the years Indian stock markets have strived to transform themselves to meet the demands of modern finance, for example, by developing a full-fledged derivatives market for futures and options. In the last decade, Indian stock markets, particularly the BSE, have witnessed many booms and busts and weathered several crises. The Sensex, considered to be the barometer of the Indian economy, has shown relatively higher volatility during the post-reforms period. The BSE has also seen recurrence of financial irregularities; in the last decade two major and a couple of minor scams have affected the market badly.

Karachi Stock Exchange (KSE), established in 1947, is the oldest and the most active of the three stock exchanges in Pakistan, and currently lists 662 companies with a total market capitalization of about \$52 billion. The KSE 100 represents major blue chips companies and is fairly good representative of the market. The current P/E ratio for KSE 100 stocks is around 18.

Exhibit A: Selected Regional Indices

Period	% Change	Daily Return	Capitalization	Turnover
Jan 2000 to Feb 2006	In Index	Volatility	Ratio	Ratio
KSE 100 (Pakistan)	686.25%	1.57%	23.8	40.1
SENSEX – Mumbai (India)	92.93%	1.51%	46.6	14.1
Hang Seng – Hong Kong	-8.35%	1.31%	271.4	43.5
SET – Thailand	54.39%	1.40%	57.1	18.2
SES All – Singapore	-8.34%	1.03%	111.6	39.3
MSCI WORLD INDEX	-10.26%	0.92%	-	-
S&P 500 COMPOSITE	-12.00%	1.15%	-	-

Similar to some other emerging markets, KSE has a limited role in raising new capital; e.g., there were only five new listings in the market in 2005. Furthermore, despite the small size of the market, it experiences a high turnover and high price volatility. From the plot of the KSE 100 index price index over the five year period 2001-2005 (See Figure 1), we can see that the market experienced significant fluctuations over shorter time intervals. Finally, a skewed size distribution of stocks traded is observed for the KSE i.e., skewed in terms of size, trading patterns, volume of brokers' trading and weighted value of stocks in the index. This is particularly true for top 20 stocks accounting for 85% of the overall turnover.

Exhibit A provides salient features of BSE and KSE along with some selected indices for comparisons. The spectacular rise in the KSE index by 686% over the six year period is remarkable, though 93% appreciation of the BSE also stands in sharp contrast with the performance elsewhere in the world. We also note that the two markets are relatively more volatile as measured by standard deviation of the daily price changes. It is interesting to note the sharp contrast between Pakistan's capitalization ratio (which is low) and relatively high turnover ratio which seems to reflect the large speculative element in the market.

The Badla or Traditional Carry Forward System

Badla, meaning something in return, is a local term for a forward trading facility, and has been an old and traditional informal institution common to both India and Pakistan. A *badla* transaction is essentially a *repo* transaction carried out in a separate after-hours market where the borrower who takes the *badla* from a *badla* broker, carries forward his security exposure from the current settlement period to the next one, by sale of his position in the present period and its repurchase in the subsequent settlement period at a predetermined price differential. In the event of a purchase, the investor may want to carry forward the transaction to the next settlement cycle and for doing so, he has to compensate the seller who sold it with an intention of getting cash.

Market Crisis and Regulatory Response

The Indian Experience

In June 1991, the new Indian government accelerated the process of economic liberalization, privatization and opening up of the Indian economy, setting off expectations of an unprecedented growth and prosperity for the economy. The stock market started booming - the BSE Sensitive Index rose from around 1000 in February 1991 to a peak of 4500 in March 1992. This led to an enormous increase in the demand for margin finance required by investors while, on the other hand, there were heavy margins imposed by the BSE. It led some of the market participants to find innovative solutions, sometimes not legal, to meet their financing requirements.

The new free market environment put immense pressure on the public sector, in particular the nationalized banks, to improve financial performance and capital adequacy. Banks, holding large cash balances not subject to reserve requirements under the Portfolio Management Scheme and cash raised by the public sector units through foreign exchange borrowing, became eager to explore new venues of higher returns. The market did not take long to innovative ways of avoiding regulation and diverting funds from the banking system to the stock market. It was done mainly through the *ready forward deal* mechanism, a variant of *repo* or repurchase agreement, and the *badla* system often using fraudulent and non-existing securities. The resulting "securities scam," personified by Hashad Metha, led to a diversion of funds to the tune of over \$ 1.2 billion from the banking system to the stock market during the period April 1991 to May 1992. For a detailed reconstruction of the scam, and regulatory response see Barua and Varma (1993).

With the discovery of the scam, the stock prices dropped by over 40% in less than two months, wiping out market value by about \$35 billion. The government responded by setting up a special court and promulgated an ordinance with several harsh provisions, including attachment of the properties of the accused in the scam. It also voided all transactions in "tainted shares" that had been routed through involved brokers, which caused market disruption. An unintended consequence was to slow down the reform process which busted the speculative boom of early 1990.

The *badla* system was blamed for causing "excessive speculations" in the market and for the irregularities in the stock exchanges in the form of non-enforcement of margins, non-reporting of transactions and illegal trading outside the stock exchange. Consequently, in March 1994 the Securities and Exchange Board of India (SEBI) effectively banned the facility, but, yielding to the demands from the brokerage community, introduced a modified *badla* system subject to certain safeguards effective January 1996. In 1997 further safeguards were put in

place, such as segregation of carry forward transactions at the time of execution of trade, daily margin of 10%, 50% of which would be collected upfront, and overall carry forward limits per broker.

In the late 1990's the *dotcom boom* in information, communications, and entertainment stocks all over the world contributed to the bull run on the BSE, which almost doubled in a short period from January 1999 to February 2000. The speculative spell led to overextended positions, and afforded many opportunities for fraud and manipulation, personified by the *Bombay Bull*, Ketan Parekh, considered to have been the main villain. He had managed to manipulate ill-liquid stocks, known as the 'K-10' stocks, by borrowing from various companies and banks using the shares as collateral. It worked well in the bull market, but busted when the markets started crashing in March 2000, led by a fall in the NASDAQ. In the next two months, while the NASDAQ declined by 35.9%, Sensex lost 23% and the K-10 stocks crashed by 67%, (for details see ICFAI, 2002).

It appears that a lack of effective regulations and surveillance of *badla* financing permitted highly illegal and speculative positions. The ensuing market crash prompted SEBI to launch a cycle of regulation to control the damage including increasing margin requirements, imposing restriction on short sales, and requiring stock deliveries following sale. It suspended all the broker member directors of BSE's board and banned trading by exchange officers. The *badla* system was banned, effective from July 2001, and a rolling settlement system was introduced.

The Pakistan Experience

The KSE experienced a steady bull run as reflected in both the KSE 100 index and trading volumes, starting just after the last stock market crisis in May 2002, which accelerated towards the end of 2004. The KSE 100 saw an unprecedented rise of 65%, from 6,218 on December 31, 2004 to 10,303 on March 15, 2005, along with an increase in the value traded from around \$300-400 million to \$1-2 billion per day. The market turned negative in the second half of March, 2005 and index dropped to as low as 6,939 on April 12, 2005, a decline of 32.7 percent from its peak. The sharp rise in the index could not be explained by any change in the fundamentals. The following precipitous fall is also somewhat of a puzzle. Such a meteoric rise in index and a subsequent crash is indicative of a classical speculative bubble in the equity market.

Badla has been blamed as one of the reasons for the March 2005 crisis. Pakistan's influential financial newspaper Business Recorder stated two problems with "*badla*" financing: first, *badla* financing is only open to a small number of market players, which also includes financial institutions, as opposed to share trading. Second, *badla* financing is provided by short-term investors and the hot money can disappear overnight. During 2004-05 KSE investors were willing to borrow at exorbitant *Badla* rates (which were capped at 18% in KSE but rose in the uncapped Lahore Stock Exchange to over 100%) because the accelerated rise in stock prices made even expensive borrowing feasible. The COT (*badla*) financing ranged from 33% to 45% of investment at KSE throughout 2004. The higher demand for *badla* investment increased the average *badla* rates to 11.4% in 2004, ranging from 12 to 19 percent, from 9.4 % in 2003, even though market interest rates remained low through most of 2004.

The growing availability of *badla* financing brokers and institutions added to the buying frenzy, though some of the major *badla* providers were simultaneously selling in the futures market. In other words, "there was a strong nexus between lenders and brokers/investors who could influence market sentiment to their own advantage" (*Task Force Report, 2005*). The

chairman of SECP stated on July 16, 2005 that “*badla*” was the root cause of almost all previous crises at the bourses, and was to be rooted out, and that the *badla* and margin financing could not co-exist. The Task Force recommended that there was a need for structural reforms and steps were needed to protect public interest by ensuring that the financial might that has been accumulated by the stock brokerage and *badla* financing institutions should be effectively checked and brought to a reasonable size to ensure that they are unable to manipulate the market and adhere to international practices.

Besides *badla* financing, other factors which contributed to this “bull run” included, increased liquidity due to higher foreign remittances, a regime of low interest rates, IPO’s of public sector enterprises marked for divestment and floatation of more mutual funds. During this period, especially since mid October, 2004, there was an unusual build-up in the media about the prospects of a rise in the KSE index. Statements from government officials linked the rise in the KSE index to good economic management, indicated that the market was destined to rise further, and announcement of the impending accelerated program for the privatization of prominent and profitable public sector corporations fuelled the bullish sentiment. Conduct of corporate officials contributed to the market speculation; for example, rumors of new oil and gas discoveries which would raise stock value manifold went un-refuted or clarified by the management. There were allegations of “wash trades” and “pump and dump” plays by brokers.

Analysis of Market Behavior

This section presents empirical analysis of the impact of abolishing *badla* system in the two countries in order to subdue speculative behavior with reference to stock price volatility. Among the related research, in the context of India, Bhattacharya, Sarkar, Mukhopadhyay and, Debabrata, (2003) examine the stability of the day-of-the-week effect in returns and volatility during 1991–2000 and do not find the estimated coefficient of the dummy variable for *badla* financing to be significant. Goswami and Angshuman (2000) also report that *badla* trading had no impact on the day-of-the-week pattern of returns. Eleswarapu and Krishnamurti (2005) study whether *badla* financing facility had led to speculative volatility on the Bombay Stock Exchange prior to March 1994. They do not “find any evidence that supports the allegations made by regulators that *badla* trading destabilizes the stock prices and causes excessive volatility.” The impact of abolishing of *badla* system in Pakistan has not been studied so far to our knowledge. However, Ahmed, Rosser and Uppal (1996) document the existence of bubbles over the period 1987-1994. Mangla and Uppal (1996) report market inefficiencies. The existence of price manipulative behavior on the KSE is rigorously documented by Khawja and Mian (2005).

In order to empirically analyze the impact of abolishing of *badla* system, we study the return volatility in the two stock exchanges before and after the events. It is strongly argued in the finance literature (e.g., De Long, Shleifer, et al, 1990a, 1990b) that *noise traders* cause excessive trading and volatility. Speculative trading in derivative securities has also been blamed for excessive volatility (Jegadeesh and Subrahmanyam, 1993). Some economists have argued for imposing tax on short-term trades to contain volatility (e.g., Stiglitz 1989).

Data and Sample Period

Data for this study was taken from the Datastream International, Ltd. Database for the Karachi Stock Exchange 100 Index (KSE100) and for Bombay Stock Exchange index of 30 major companies (BSE 30 SENSITIVE). Daily closing values of the indices were used for the

period from 1/1/1993 to 12/29/1995, and from 1/1/2000 to 3/31/2003 for the BSE to cover the two periods during the period of change. The corresponding event window is from 1/1/2004 to 2/28/2006 for the KSE. We study the market behavior by dividing it into sub-periods, before and after the structural change was implemented, as shown in Exhibit B.

Exhibit B:

MARKET	EVENT DATE	STUDY SUB-PERIODS
BSE	March, 1994	Sub-Period I: 1/1/1993 to 2/28/1994
		Sub-Period II: 6/1/1994 to 12/29/1995
	July, 2001	Sub-Period I: 1/1/2000 to 6/29/2001
		Sub-Period II: 10/1/2001 to 3/31/2003
KSE	March, 2005	Sub-Period I: 1/1/2004 to 2/28/2005
		Sub-Period II: 8/1/2005 to 2/28/2006

For the BSE, we leave out a three month intervals between the sub-periods to allow the market to adjust to the new financing environment. For the KSE, we exclude five months since the issue remained under consideration for longer period and the change was not implemented immediately. All price data was converted to “returns” by taking the natural log differences of the index level P_t thus: $R_t = \ln(P_t) - \ln(P_{t-1})$. Figure 1 graphs the market indices and return volatility for BSE and KSE for the periods under study. It is noteworthy that the Bombay stock exchange was quite bullish before the event date, March 1994, but had a mixed experience afterwards. During the 2000-03 period, the BSE index shows a general bearish trend. The graph for the KSE, however, shows that the market was strongly bullish before March 2005, but resumed its bullish course, after a brief ‘crash’ over the 3-4 month period. It is also observed that that the return volatility was lower for the BSE in the later period, while the volatility was higher in later period for the KSE.

Results

Summary statistical results for the first four moments for the return series are shown in Table 1. It is noteworthy that the return distributions in both countries exhibit significant departure from the normal distribution, Skewness and Kurtosis are very significant, and the Jarque-Bera statistic for both markets and for all periods strongly rejects normality hypothesis. Results for tests for difference in mean and variance of two sub-period samples are presented in Tables 2 and 3 respectively. For the 1994 instance of abolishing *badla* in India, the mean daily return for the BSE in the first sub-period is 0.1636%, while it is -0.0503% in the second sub-period. The t-test for mean difference is significant at 5% level; one-tail probability ($T \leq t$) is 3.5%. On the other hand, for the second event of banning *badla* system in 2001, the mean difference is not significant at conventional levels; the achieved significance level is 16.2%.

In Table 2, the t-test for mean difference in the daily return on the KSE in the two sub-periods is not significant; one-tail probability ($T \leq t$) is 16.6%. Though the mean difference is not significant, it is interesting to note that the sample mean return in the second period is 1.5 time higher than in the first period, i.e., 0.3% vs. 0.2%. It seems that the KSE bullish sentiment may have strengthened in the later period, contrary to the intentions of the regulators. Table 3 (panel A) presents the test results for difference in the variance over the studied events in the two markets. For the BSE, the F-test for unequal variance strongly rejects the null hypothesis both for the 1994 and 2001 episodes. For the 1994-95 study period the variance of daily returns in the

second sub-period was significantly lower than in the first; 0.0126% compared with 0.0327%. For the 2000-03 study period, the variance in the later sub-period (0.0128%) was significantly lower than in the first sub-period (0.0420%). The behavior of the KSE, however, appears to be quite opposite. The sample variance is actually higher in the second period than in the first, 0.0129% vs. 0.0098%. The F-test for unequal variance rejects the null with a p-value of 2.5%.

In order to study the response of the two markets with respect to the regulatory changes with more robust controls, we expanded the empirical tests to exclude possible external influences and *conditional auto-regressive heteroskedasticity* in the variance process. The former influence was incorporated by including the MSCI World index in a GARCH-M model and then examining the residuals. The results of the tests of variance equality on the residuals from the model are presented in panel B of Table 3, which conform to the first set of tests reported in panel A.

Summary and Conclusions

From our empirical tests, it appears that the bullish sentiment and volatility on the KSE continued unabated despite the measures taken by the SECP to curtail “speculative” trading allegedly fanned by the *badla* system. On the other hand the regulator of the BSE appears to have succeeded in their goals of cooling off the market in the 1994-1995 as well as in the 2000-03 periods. It is possible that extra-market manipulations by speculators may have frustrated the efforts of the KSE regulators, such as documented by Khawja and Mian (2005). Another possible explanation may be that the *badla* system may not have been a cause of the alleged “speculative bubbles” in the two markets, as reported by some other researchers for the Indian market.

We note, however, that the response of the Indian regulators in dealing with the market manipulations and securities fraud appears to be much stronger than was the case in Pakistan. The Indians regulatory response was three pronged: 1) discovering and punishing the guilty, 2) recovering the money, and 3) reforming the system. The Pakistani regulators on the other hand only pursued institutional restructuring mainly focusing on replacement of the *badla* system. No criminal or civil charges were filed, and no recovery was sought. This response may have been perceived by the market as weak, and may not have conveyed a strong signal to the market regarding government’s resolve for effective enforcement. Another relevant factor is that in India the National Stock Exchange is a viable competitor to the BSE, and the competitive environment creates stronger pressures on the stock exchanges for reform, modernization and compliance.

TABLE 1
SUMMARY STATISTICS

<i>Index Return Daily Percent</i>	Bombay Stock Exchange 1993-1995			Bombay Stock Exchange 2000-03			Karachi Stock Exchange 2004-06		
	<i>Jan 93 to Dec95</i>	<i>Jan 93 to Feb 94</i>	<i>Jun 94 to Dec 95</i>	<i>Jan 00 to Mar 03</i>	<i>Jan 00 to Jun 01</i>	<i>Oct 01 to Mar 03</i>	<i>Jan 04 to Feb 06</i>	<i>Jan 04 to Feb 05</i>	<i>Aug 05 to Feb 06</i>
Mean	0.0222	0.1636	-0.0503	-0.0586	-0.0949	0.0207	0.1668	0.2025	0.3075
Variance	0.0206	0.0327	0.0126	0.0271	0.0420	0.0118	0.0201	0.0098	0.0129
Skewness	-0.1077	-0.2828	0.1524	-0.3388	-0.2583	0.2787	-0.4415	-0.5222	-0.3971
Kurtosis	2.9242	2.1863	0.8294	2.6123	1.1944	1.2321	2.2436	2.4753	1.9356
Minimum	-0.0899	-0.0899	-0.0385	-0.0742	-0.0742	-0.0395	-0.0470	-0.0356	-0.0361
Maximum	0.0563	0.0563	0.0418	0.0712	0.0712	0.0445	0.0580	0.0342	0.0373
Jarque-Bera	279.77	64.17	13.449	256.73	27.52	29.81	136.62	91.12	27.72
Observations	781	302	413	846	390	391	564	303	152

TABLE 2
TEST FOR MEAN EQUALITY

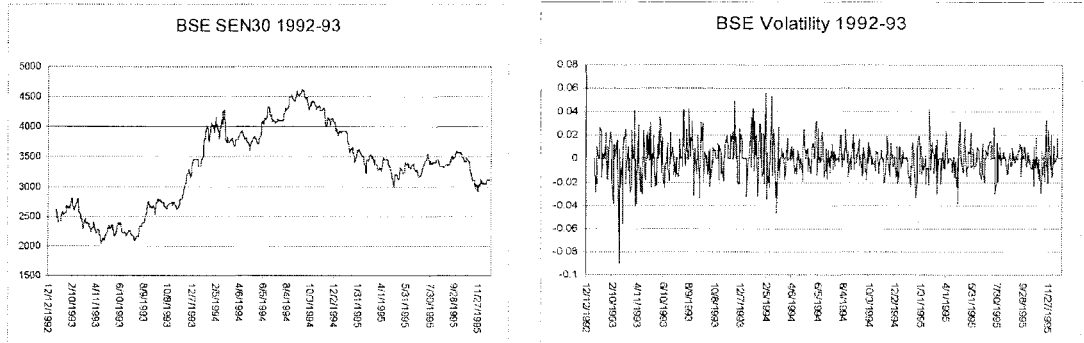
T-Test For Mean Difference: Assuming Unequal Variances			
<i>Index Return Daily Percent</i>	BSE30 1993-95	BSE30 2000-2003	KSE100 2004-06
Mean 1st Sub-period	0.1636	-0.0949	0.2025
Mean 2nd Sub-period	-0.0503	0.0207	0.3075
t Stat	1.8172	-0.9848	-0.9699
P(T<=t) one-tail	0.0349	0.1626	0.1665

TABLE 3
TEST FOR VARIANCE DIFFERENCE

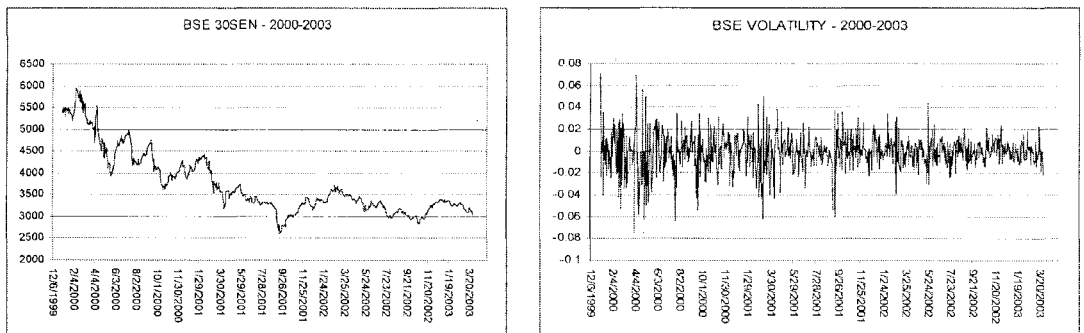
PANEL A: F-Test for Unequal Variances			
<i>Index Return Daily Percent</i>	BSE30 1993-95	BSE30 2000-2003	KSE100 2004-06
Variance 1st Sub-period	0.0327	0.0420	0.0098
Variance 2nd Sub-period	0.0126	0.0118	0.0129
F Stat	2.6024	3.5499	1.3101
P(F<=f) one-tail	0.0000	0.0000	0.0252
PANEL B: F-Test for Unequal Variances Using Residuals from the GARCH-M Model			
<i>Index Return Daily Percent</i>	BSE30 1993-95	BSE30 2000-2003	KSE100 2004-06
Variance 1st Sub-period	0.0333	0.0393	0.0099
Variance 2nd Sub-period	0.0123	0.0115	0.0128
F Stat	2.6998	3.4099	1.3031
P(F<=f) one-tail	0.0000	0.0000	0.0277

FIGURE 1: STOCK MARKET INDICES AND VOLATILITY

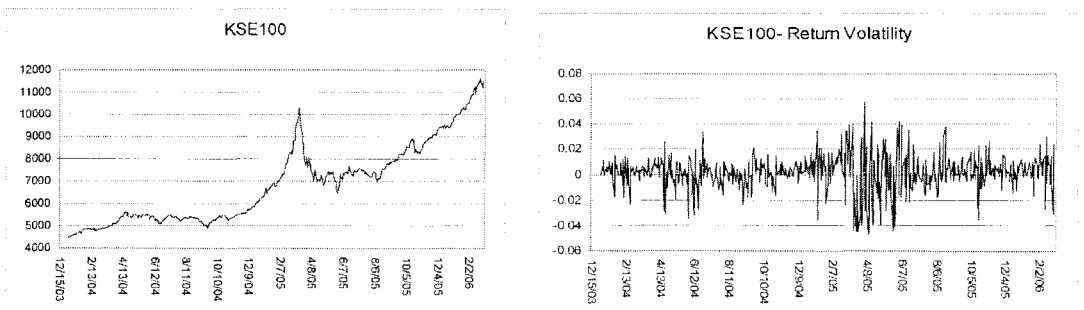
A: BSE, 1993-1995 PERIOD



B: BSE, 2000-2003 PERIOD



C: KSE, 2004-2006 PERIOD



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