

IMPACT OF GLOBALIZATION ON STOCK MARKET DEVELOPMENT IN INDIA

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OBJECTIVE of this paper is to examine the impact of globalisation on stock market development in India using commonly recognised indicators to test this impact. India implemented significant reforms to foster development in capital markets. These reforms were brought in with the objective of improving market efficiency, transparency, and preventing unfair trade practices. Indicators used in our study are good proxies for the test of market development and deepening. Results of this study show that the stock markets in India have experienced exponential growth over the study period. Our analysis finds that all selected indicators show significant improvement in stock markets of India. After liberalisation market capitalisation ratio, value traded ratio and turn-over ratio increases and volatility ratio has declined. Our results demonstrate overall development in stock markets and operational efficiency in stock markets of India.

Key Words: Globalisation, Stock Market Development, Market Capitalisation, Liquidity, Volatility, Capital Market Reforms in India.

Introduction

During 1980s, the developing countries started liberalising their economies. Equity flows to developing countries have increased sharply in recent years as a result (Bhaduri, 2000). There has been a greater emphasis on the development of equity markets as a part of financial reforms. India has also followed this path. With the globalisation, financial markets are becoming more and more important every day. A developed stock market is considered crucial to national economic growth as it provides an additional channel along with banks and other financial institutions, for encouraging and thus mobilising domestic savings. It also ensures improvements in the productivity of investment through market allocation of capital and increases managerial discipline through the market for corporate control. A study by 'World Institute for Development Economic Research' (WIDER, 1990) has argued that the developing countries should liberalise their financial markets in order to attract foreign portfolio equity flow. The huge amount of financial capital available in the developed countries through pension and investment funds could be attracted to the developing countries provided the latter liberalised their markets externally and developed their stock market internally. Capital markets have taken a prominent place in the developing countries' financial system during the last decade. 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 markets¹ by global and regional funds. Stock market liberalisation in many developing countries took place during the period 1985 to 1995 when market capitalisation of all

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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 these 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, signalling significant growth in these markets (Husain and Qayyum, 2006).

Foreign equity investment can be beneficial to developing countries because of its risk-sharing characteristics and effects on resource mobilization and allocation. With financial integration, developing countries have become increasingly attractive destinations for international investors who are seeking a higher return than what is available in the developed economies. Stock markets of developing countries have become more, although not fully, integrated with world financial markets, and this increased integration implies a lower risk-adjusted cost of capital, which is possible by diversifying the risk. The correlation between returns of emerging markets (developing markets) with developed markets is lower than the return available in the developed economies, the risk – return profile of the portfolio can be improved (Agarwal et al., 1999). This has created the prospects of a more efficient world wide allocation of savings and investment than was possible earlier, when domestic investment in most countries was constrained by domestic savings. Thus, big financial investors in the developed countries, while diversifying their risk, find developing countries a more attractive destination. He emphasised that India has either negative or very low degree of correlation with developed countries. Thus opening up of Indian economy has brought funds from developed countries. In the wake of globalisation of economic policies, the Indian business scenario is undergoing a dramatic transformation. Investment opportunities have expanded, financing options have widened, and above all dependence on capital market has increased.

The Bombay stock exchange, one of the main stock exchanges of India has the second-largest number of domestic quoted companies of any stock exchange in the world. Beginning in the mid-1980s Indian markets were slowly liberalized. Until 1990-91, the securities market did not develop in consonance with the rest of the economy for various reasons. The trading and settlement infrastructure remained poor. Trading on all stock exchanges was through open outcry. The settlement systems were paper based. Disclosure requirements were inadequate. There was no apex regulatory authority for regulation and inspection of the securities markets. The stock exchanges were run as broker's clubs. There was a predominance of insider trading and unfair trade practices (Sen and Vaidya, 1997). The practice of forward trading had created unnecessary speculation. The large scale irregularities in securities transactions required stock market reforms to take place. The economy reached the end of this road in 1990-91 with a severe balance of payments crisis, threatening a default in India's foreign debt payments. This crisis, and the conditions imposed by the IMF-led to an era of reform consolidation on the earlier reforms initiated in the early and mid 1980s. There have been significant changes in the securities market in India during the last two decades. This is mainly due to the reforms/initiatives taken by the Government and the regulators. The motive behind reforms in the securities markets in the 1991 was the broad goal of giving markets, rather than government, a greater role in shaping resource allocation. As in many other countries around the globe, this constituted deregulation, liberalization of the external sector and partial privatization of some of the state sector enterprises. In many ways the reforms that started in 1991 have transformed the economy through the twin forces of globalization and competition. As a result, the market microstructure has been modernized and refined.

Objectives of the Study

This study aims to assess impact of globalisation on stock market development in India. Theory does not provide a unique concept of stock market development to guide empirical research. Existing models suggest that stock market development is a multi faceted concept, involving issues of market size,

market liquidity, and integration with world capital markets. Using measure of market integration, as well as measures of stock market i.e. market size, liquidity, volatility, concentration, and institutional development for forty four developed and emerging markets from 1986 to 1993, Demirguc-Kunt and Levine (1996) find that large markets tend to be less volatile, more liquid, and less concentrated in a few stocks than smaller markets.

The three stock market indicators, viz, size, liquidity, and volatility were considered and two time series trend break techniques of Perron were applied on monthly data of Bombay Stock Exchange, by Biswal and Kamaiah (2001) and they found that the Indian stock market grew and became more liquid after liberalisation. However, in respect of volatility the market had not exhibited any significant changes. The period covered by them was up to 1998. Subsequently there were significant changes in the development of Indian stock market. For the purpose of this study, we have used same indicators as suggested by Biswal and Kamaiah (2001) i.e., Size, Liquidity, and Volatility and then tested to see if these indicators will exhibit any trend over time in response to various stock market regulations.

The objective of the paper is to assess market development through measures involving market size, liquidity, and volatility.

1. Size of the Indian stock market has increased during the period 1990-91 to 2006-07.
2. Liquidity of the Indian stock market has increased during the period 1990-91 to 2006-07.
3. Volatility in the Indian stock Indian stock market has increased during the period 1990-91 to 2006-07.

Data and Research Methodology

The data used for the analysis of stock market development after liberalisation period has been collected from hand book of statistics on Indian Economy by SEBI. Economy wide data has been collected from the annual reports and other publications of RBI. Besides this other information regarding stock market development has been obtained from NIC, economic surveys and other published reports of Government organisations. BSE 100 index² has been used as a proxy for market for calculating volatility of the Indian stock market.

To avoid factors such as temporal stability and business cycle influencing our study, a longer time frame of study of 17 years period i.e., 1990-91 to 2006-07 has been used. This period is chosen to correspond with the period when changes in trade policy were taking place and Indian economy went through a phase of increasing competition, deregulation, and restructuring. Further three sub periods are chosen within this period, 1990-91, 1997-98 and 2002-03 to study the impact of reforms announced by government in phases. While 1990-91 signified the beginning of the reforms after liberalisation, 1997-98 was chosen so that it would capture the changes initiated in the reforms I and the beginning of reforms II. The end-year 2002-03 comes five years after the process of second phase of reforms was initiated in 1997-98, and is chosen so as to capture any changes that may have taken place as a consequence.

Ratio analysis technique of financial management has been used to analyse the movements over the period. The average of each ratio is computed and tabulated to study the indicators of stock market development in post liberalisation scenario and over sub-periods. The data has been analysed by using Statistical Package for Social Sciences (SPSS).

In order to meet the objectives of the study, a measure of stock market size, Market Capitalization Ratio (MCR) is used. The size of the stock market depends on the activity of the primary market because it is only when more entities come into the market and raise funds, that more instruments are

available in the secondary market. Therefore, a two way causal relationship exists between stock market size and primary market activities. As a measure of stock market size, Market Capitalization Ratio (MCR) is used which is defined as the value of listed shares divided by Gross Domestic Product (GDP). Market capitalization is computed using the value of the equity securities only. The stock market price per share is multiplied by the number of shares that are outstanding. Market capitalization as a proxy for market size is positively related to the ability to mobilise capital and diversify risk.

Liquidity is the ease and speed at which economic agents can buy and sell securities. With a liquid market, the initial investors do not lose access to their savings for the duration of the investment project because they can easily, quickly, and cheaply, sell their stake in the company. Thus, more liquid markets could ease investment in long term, potentially more profitable projects, thereby improving the allocation of capital and enhancing prospects for long term growth. The more liquid the stock market, the larger the amount of savings that are channelled through the stock market. Liquidity is key to a successful securities market. Therefore, we expect a more liquid stock market to lead to higher stock market development.

For market liquidity, two measures are used: (1) Value traded ratio, (2) Turnover ratio. Value traded ratio equals the total value of traded share in the stock market divided by GDP. The total value traded ratio (VTR) measures the organised trading of the equities as a share of national input and should, therefore, positively reflect liquidity on an economy-wide basis. The second measure of the liquidity is the turnover ratio which equals the value of total shares traded divided by the market capitalisation. High turnover is often used as an indicator of low transaction cost. Turnover ratio also complements total value traded ratio.

According to Levine and Zervos (1998) Value traded ratio does not directly measure how easily investors can buy and sell shares at posted prices. However, it does measure the degree of trading relative to the size of the economy. It, therefore, reflects stock market liquidity on an economy wide basis. The value traded ratio complements the market capitalisation. Although a market may be large, there may be little trading. Thus, taken, MCR and VTR together provide more information about a stock market than if one uses only a single indicator.

The second measure of the liquidity is the turnover ratio which equals the value of total shares traded divided by the market capitalisation. High turnover is often used as an indicator of low transaction cost. Turnover ratio also complements total value traded ratio. Although VTR captures trading compared with the size of the economy, turnover measures the trading relative to the size of the stock market. Thus, the complete information on the total VTR and turnover ratio provides a more comprehensive picture of liquidity of a stock market.

As shown by Levine (1991) and Bencivenga et al. (1996), stock markets may affect economic activity through the creation of liquidity. Many profitable investments require a long-term commitment of capital, but investors are often reluctant to relinquish control of their savings for long periods. Liquid equity markets make investment less risky and more attractive because they allow savers to acquire an asset-equity and to sell it quickly and cheaply if they need access to their savings or want to alter their portfolios. At the same time, companies enjoy permanent access to capital raised through equity issues. By facilitating longer-term, more profitable investments, liquid markets improve the allocation of capital and enhance prospects for long-term economic growth. Further, by making investment less risky and more profitable, stock market liquidity can also lead to more savings and investment. According to Hicks (1969), more liquid financial markets made it possible to develop projects that required large capital injections for long periods before the projects ultimately yielded profits. Without liquid capital markets, savers would have been less willing to invest in the large, long-term projects.

Stock markets may also affect incentives for investors to acquire information about firms. Larger,

more liquid markets make it easier for an investor who has obtained information about a firm to trade at posted prices. Thus, the investor can make money before the information becomes widely available and prices change (Kyle, 1984). If investors can profit from obtaining information, they will be more likely to research and monitor firms. Thus larger and more liquid stock markets increase incentives for the investor to have more information about the firms and the improved information will develop resource allocation and accelerate economic growth. By contrast, Stiglitz (1993) argues that developed stock markets quickly reveal information through price changes. This quick public revelation creates a free-rider problem; it reduces incentives for investors to expend lots of resources in obtaining information about firms because investors can get this information by observing prices.

Third chosen indicator of stock market development is the volatility parameter which conceptualises the asset price movement in the stock market. There is an important link between financial market uncertainty and public confidence. Policy makers, therefore, rely on market estimates of volatility as a barometer of the vulnerability of financial markets. The existence of excessive volatility or “noise” also undermines the usefulness of stock prices as a “signal” about the true intrinsic value of a firm, a concept that is core to the paradigm of informational efficiency of markets.

Volatility can be defined as changeability or randomness of asset prices. Theoretically, a change in the volatility of either future cash flows or discount rates causes a change in the volatility of share prices (Schwert, 1989).

The perception of both the public and the press about stock market volatility, in fact, is largely based on point changes. Finance academicians, however, widely agree that volatility should be measured in terms of percentage changes in prices or rates of return, thus discarding the use of absolute “amount” of changes in asset prices. Point changes usually exceed percentage changes because the index levels from where the prices move are often greater than 100 (Jones and Wilson, 1989). Thus, the point changes invariably overestimate and create a false impression regarding the magnitude of volatility among the investors. Thus, the present study relies on percentage and not on point changes of prices. The percentage changes in prices, in fact, reflect the rates on return.

The widely accepted concept of rates of return is, of course, the logarithmic difference of prices of two successive periods. This concept is also followed in the present study. Symbolically, the rate of return (r) may be stated as follows:

$$r_t = \ln (p_t / p_{t-1}), t=1, 2, \dots, n$$

Where r_t is the rate of return for the period t , and p_{t-1} and p_t are the prices for two successive periods ($t-1$) and t .

In finance literature, there are number of alternative methods to measure volatility (Beckers, 1983). Volatility has been measured by the standard deviation of rates of return (r), which is a simple but widely used method, and also most suitable for the nature of data available in our study.

The standard deviation of return (r) from a sample of n observations is the square root of the average squared deviation of returns from the average in the sample. Thus $\sigma = \left[\frac{1}{n} \sum_{t=1}^n (r_t - \bar{r})^2 \right]^{\frac{1}{2}}$; where $r_t = \ln (p_t / p_{t-1})$

In general, it is understood that less volatile market reflects greater market efficiency and development. However, greater volatility is not necessarily a sign of less developed stock market. Volatility of an asset price is standard deviation of the asset return over a particular period of time, i.e. the deviation of

the absolute returns from the mean return measures the volatility. For this study monthly volatility measures would be used which is computed as the 12 month rolling standard deviation estimate that is based on market returns.

The monthly closing prices of the BSE100 are used as a source data to arrive at the yearly data. Sensex was a natural choice for our analysis, as it is the most popular market index and is widely used by market participants for benchmarking. Sensex, as data for analysis, however, has been sometimes criticised by the researchers because it considers 30 large scrips only. The movement of Sensex is not a true representative of the movement of the market. Therefore, for the purpose of this study, BSE 100 index has been used for a wider coverage of the companies.

Theoretical literature, therefore, does not provide us with an unambiguous conclusion on the impact of stock market liberalization on stock return volatility. The empirical studies investigating the volatility of returns have yielded mixed conclusions. Aggarwal et al. (1999) analyse volatility in emerging stock markets during 1985-95. They find that mostly local events cause jumps in the stock market volatility of the emerging markets. Kim and Singal (2000) and De Santis and Imorohoroglu (1997) study the behaviour of stock prices following the opening of a stock market to foreigners or large foreign inflows. They find that there is no systematic effect of liberalization on stock market volatility. A common claim of all these studies is that, the proposition that liberalization increases volatility is not supported by empirical evidence. However, Levine and Zervos (1996) suggest that volatility may increase after liberalization. Their study shows that countries which reduce barriers to international capital flows, enjoy rapid improvements in the functioning of their stock markets. Although stock return volatility may rise in the short term following capital control liberalization, countries that are more open to international capital flows tend to have less volatile markets in the long run than those with tighter capital controls. Thus the results of this study are in line with Levine and Zervos (1996).

Analysis and Results

In this study, the development and growth in the stock market of India is measured with the help of selected indicators of development. Following figure (Figure 1) highlights the salient features of stock market of India.

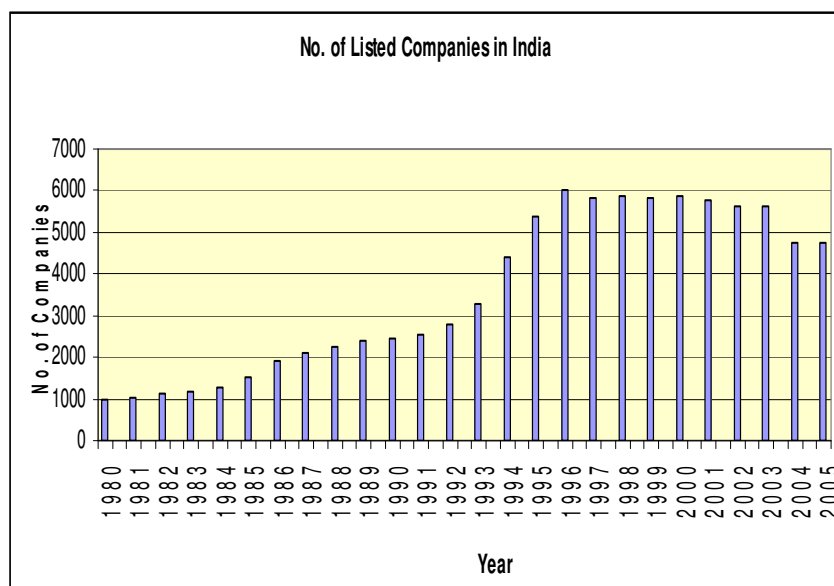
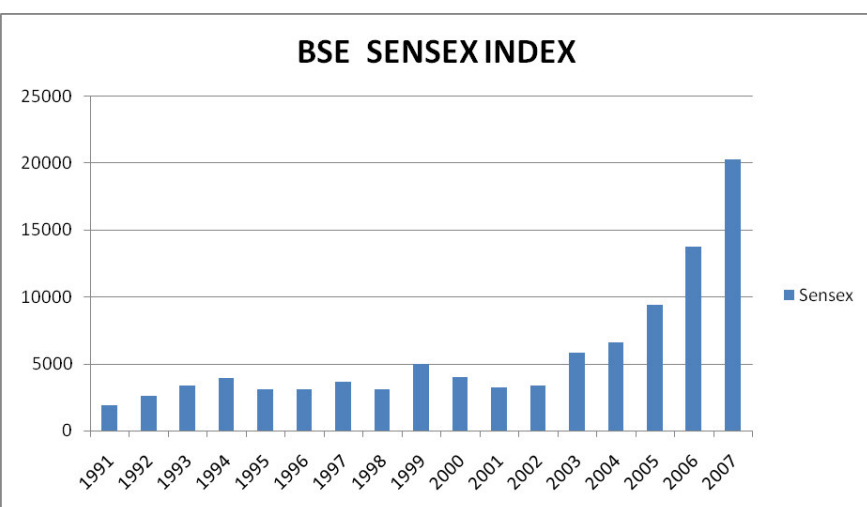


Figure 1: Number of Listed Companies in India

There was rapid expansion in 1980s and 1990s as measured by number of companies listed on the stock market. The listing more than doubled within four years of liberalisation and reached to almost 6,000 in 1996 deepening the market. After a peak of 5,999 listed companies in the year 1996, number declined slightly in 2003 with 5644 listed companies on BSE. This declined further in year 2005 to 4763. After liberalisation stock markets in India have grown significantly as measured by number of listed companies. This growth is further demonstrated by the rise in BSE Sensex in Figure 2.



BSE Sensex Index

For the development of the stock market in the 1990s in India. As a result BSE Sensex rose from 6000 in 1994, rising unabated since then

Global capital flows to the market strengthened. In 1992, the financial liberalization allowed the private capital flows. Access to the equity markets, and no longer requires any formal approval. This led to an increase in the inflows of portfolio capital in

The level of integration of a stock market with stock markets of other countries is shown by foreign portfolio investment. It also indicates growth level of a stock market. Foreign Institutional Investors (FII's) were allowed access to capital markets on registration with SEBI. Regulatory framework for investments by Non Resident Indian's (NRI) was liberalized, so that they can buy shares and debentures with prior permission of RBI. Indian Companies were permitted to access international capital markets through Euro equity shares (or American Depository receipts³). The Indian stock exchanges are permitted to set up their trading terminals abroad. RBI permitted two way fungibility for ADR'S/GDR's which meant that investors whether foreign institutional or domestic who holds ADRs/GDRs can cancel them with the depository and sell the underlying shares in the market. The company can then issue fresh ADRs in place of cancelled one. Previously this was not possible and Government permission was to be sought every time to reissue the depositories. A series of reforms in the decade of the 1990s has transformed the Indian stock market into a modern one, which is vibrant and more globalised. The increase in the number of Foreign Institutional Investors and Foreign Institutional Investment also reflects the growth in the capital market.

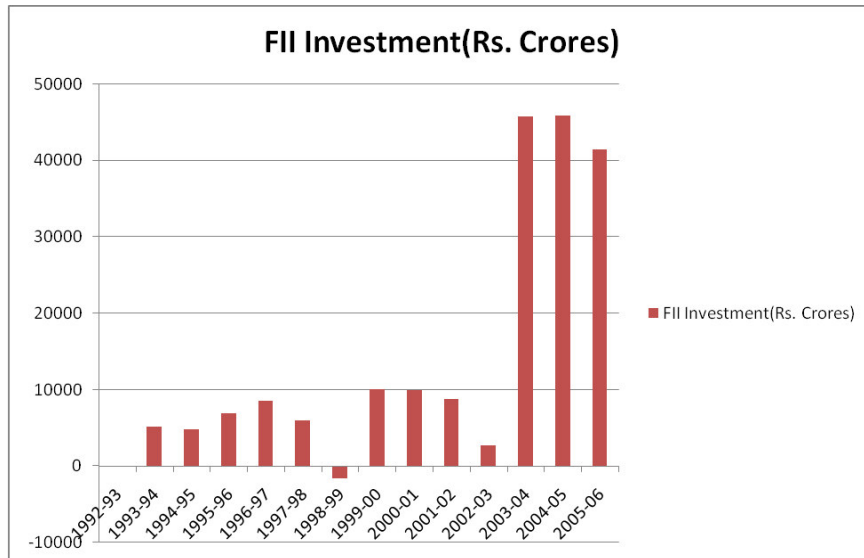


Figure 3: Foreign Institutional Investment in India

Figure 3 shows that the number of Foreign Institutional investors increased from 18 in 1993 to 882 in 2006 this is approximately a 500 times increase. Increase was faster in the initial years with a fall in 1997-99 period and again in 2005-06. Net FII investment dipped to an average of Rs. 483 Millions during 1997-99, influenced no doubt by the South-East Asian crisis. The average rose again to Rs. 960 Millions during 1999-00 to 2001-02, only to fall to Rs. 269 Millions in 2002-03. The surge began immediately thereafter and has yet to come to an end. FII investments have been an important force, even if not the only one, driving markets to their unprecedented height. A number of companies have started floating their shares in the global market and getting finances through the Global Depositories route as well as getting their shares listed on NASDAQ. Thus Securities market in India is getting increasingly integrated with the international markets.

Primary capital markets are the direct links between investors and issuers with investment needs. Therefore, it is extremely important to understand how Indian primary securities markets have helped companies to mobilize resources. The amount raised from initial public offers in India is given in Figure 4 below.

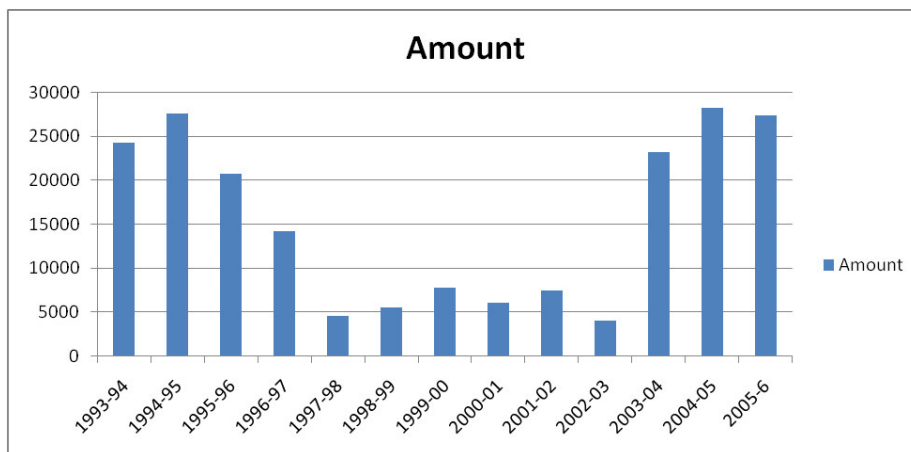


Figure 4: Total Resources Mobilised from Primary Market

Figure 4 shows that Indian primary markets picked up in the early 1990s. The above amount includes funds mobilised by banks, private placements, nongovernment public limited companies, and bonds issued by public sector companies. Resources mobilised from primary markets reached at its highest in the year 1994-95 at 2763 Millions. After which there has been a drastic decline in the amount of money raised. In year 2002-03, only 407 million rupees were mobilised from primary markets. This trend reversed after that and more than 2, 000 million rupees were mobilised during last three years from primary market.

During the early 1990s there has been a huge jump in new capital issues by non-government companies. Free pricing of equities and optimistic conditions of the secondary market are said to be the main factors behind this enormous increase in the primary market activities. Before 1992, Indian firms were required to obtain approval of CCI for raising capital. Only existing companies with substantial reserves were allowed to issue shares at premium whereas new companies were allowed to issue shares at par value only. Abolition of CCI Act in May 1992 allowed firms to price their issues freely. This resulted in a sharp increase of capital mobilised through equity related instruments.

The amount raised through new issues during 1994-95 shows a sharp declining trend and this continues till 2002-03. Only a handful of companies have entered the Indian market during this period for raising fresh capital showing overall negative sentiment and lack of confidence about the new issues market in general. But after this period, market again gained confidence of corporate sector and picked up in 2005-06. From 2003 to 2006, increase in primary market resource mobilisation was due to capital mobilisation by banks and financial institutions. After that stock market starts rising and replaces banks and financial institutions.

The above analysis shows that the primary market activities in India have declined in the second half of the 1990s. Primary market remained sluggish during a long period of around 10 years before increasing in recent years. Secondary market conditions can be one of the reasons behind the poor performance of primary market.

Stock Market Development

The secondary market is an important constituent of the capital market. Secondary market activities have strong influence on the performance of the primary market. This market provides facilities for trading in securities which have already been floated in the primary market. Thus an organised and well regulated secondary market (stock market) provides liquidity to shares, ensures safety and fair dealing in the selling and buying of securities.

The financing decision of a firm is generally affected by the minimisation of the weighted average cost of capital. Upward movement of stock prices influence firms to issue equities at a high premium which reduces the cost of capital for a firm and makes it an ideal financing choice. Another important impact of secondary market development over primary market activities is the increase in investment by firms. As the cost of equity reduces because of issue of equities at high premium, investment projects that had negative NPV before are likely to transform into positive NPV projects. Therefore, the performance of primary market is crucially dependent on the level of activities in the secondary market.

This study considers a wide range of stock market development indicators. The indicators selected are size, liquidity, and volatility.

Market Size

In 1980, the stock market capitalisation ratio was only 5% of GDP. As a result of liberalisation measures initiated in the 1980s, the ratio had risen to 13% by 1990. Market Capitalisation ratio of Indian corporate sector after 1991 i.e., the year of liberalisation is given in the Table 1.

Table 1: Market Capitalisation Ratio of Indian Corporate Sector

Year	Market Capitalisation (Rs. Millions)	GDP (Rs. Millions)	Market Capitalisation Ratio (% GDP)	Market Capitalisation (% Change)
1990-91	7000	51503	13.59	—
1991-92	12314	58409	21.08	75.92
1992-93	18676	66987	27.88	51.66
1993-94	36807	78007	47.18	97.08
1994-95	43548	91216	47.74	18.31
1995-96	52648	106981	49.21	20.90
1996-97	46392	124763	37.18	-11.88
1997-98	56033	138873	40.35	20.78
1998-99	54536	160111	34.06	-2.67
1999-00	91284	177109	51.54	67.38
2000-01	57155	190228	30.05	-37.39
2001-02	61222	207766	29.47	7.12
2002-03	57220	224473	25.49	-6.54
2003-04	120121	251992	47.67	109.93
2004-05	169843	285533	59.48	41.39
2005-06	302219	324955	93.00	77.94
2006-07	354504	376029	94.28	17.30
Sub - Periods		MCR		
1990-07		44.07		
1990-97		34.84		
1997-02		37.09		
2002-07		63.98		

Source: Handbook of Statistics on Indian Economy, 2006, RBI.

Above Table 1 shows that stock market size as measured by Market Capitalisation has grown by over 50 times during the period 1990-91 to 2006-07 whereas GDP increased by more than 7 times over the same period. MCR has steadily increased up to over 49% in 1995-96 and declined to around 25% in 2002-03 before spurting to over 94% in 2006-07. The growth in size of Indian Stock Market resembles that of other leading developing economies and is indeed very impressive.

The massive rise in the activities of the stock market, particularly in the 1990s could be attributed to a larger participation by individuals and institutional investors in the capital market. Since September 1992, the foreign institutional investors (FII) have been allowed to invest in the Indian capital market.

The significant impact of liberalization is apparent in the ratio of market capitalization to GDP which was below 10% until three years prior to liberalization, increased to 21% in the year of liberalization, remained around 40% up to 2003-04 before increasing to 94% in 2006-07. By the end of year 2008 market capitalization has crossed the National GDP by more than 100%.

The average MCR over the three sub- periods also shows the constant increase in the amount of market

capitalisation in absolute terms and also in terms of ratio. The mean value of the ratio during the study period is 44.07%. It has increased from 34.4 % in the first sub-period to 37.09% in second period and jumped off by 70% to 63.98%. This shows that the size of Indian corporate sector increased continuously at a faster rate.

Stock Market Liquidity

The Turnover of Indian stock market as a percentage of GDP is given in the following Table.

Table 2: Value Traded Ratio of Indian Stock Market

Year	Turnover (Rs. Millions)	GDP (Rs. Millions)	Value Traded Ratio (% GDP)	Value Traded (% Change)
1990-91	3601	51503	6.99	—
1991-92	7178	58409	12.29	99.32
1992-93	4570	66987	6.82	-36.34
1993-94	8454	78007	10.84	85.00
1994-95	6775	91216	7.43	-19.86
1995-96	5006	106981	4.68	-26.11
1996-97	12428	124763	9.96	148.26
1997-98	20764	138873	14.95	67.07
1998-99	31200	160111	19.49	50.26
1999-00	68503	177109	38.68	119.56
2000-01	100003	190228	52.57	45.98
2001-02	30729	207766	14.79	-69.27
2002-03	31407	224473	13.99	2.21
2003-04	50262	251992	19.95	60.03
2004-05	51872	285533	18.17	3.20
2005-06	81607	324955	25.11	57.33
2006-07	95619	376029	25.43	17.17
Sub-Periods	Value Traded Ratio			
1990-07	17.77			
1990-97	8.43			
1997-02	28.10			
2002-07	20.53			

Source: Handbook of Statistics on Indian Economy, 2006, RBI.

The above Table 2 shows that value traded as a percentage of GDP increased from about 7 percent of GDP in 1990-91 to roughly 25 percent of GDP in 2006-07. In absolute terms Turnover in the market increases more than 25 times from 1991 to 2007. During 2000-2001 there were maximum activities in the market and the value traded ratio was 52.57%.

The average value of Value Traded Ratio during the study period is 17.77%. Initially it was very low after liberalisation during the first phase at 8.43% which shows very little trading in the market as

compared to economy size. During second sub-period when the second phase of reforms started, the market has shown signs of revival and it has increased to 28.10%. In the last period, again this ratio comes down to 20.53% on a much higher GDP during which time the turnover increased by more than 90% outperforming several emerging markets.

To clearly understand the liquidity picture, the turnover ratio also has been examined. The turnover ratio is defined as the ratio of the value of total shares traded and market capitalization. It measures the activity of the stock market relative to its size. Many analysts use the turnover as measure of transaction costs. High turnover ratio implies low transaction and consequently high efficiency.

Table 3: Turnover Ratio of Indian Stock Market

Year	Turnover (Rs. Millions)	Market Capitalisation (Rs. Millions)	Turnover Ratio (%)
1990-91	3601	7000	51.44
1991-92	7178	12314	58.29
1992-93	4570	18676	24.47
1993-94	8454	36807	22.97
1994-95	6775	43548	15.56
1995-96	5006	52648	9.51
1996-97	12428	46392	26.79
1997-98	20764	56033	37.06
1998-99	31200	54536	57.21
1999-00	68503	91284	75.04
2000-01	100003	57155	174.97
2001-02	30729	61222	50.19
2002-03	31407	57220	54.89
2003-04	50262	120121	41.84
2004-05	51872	169843	30.54
2005-06	81607	302219	27.00
2006-07	95619	354504	26.97
Sub-Periods		Turnover Ratio	
1990-07		46.16	
1990-97		29.86	
1997-02		78.89	
2002-07		36.25	

Source: Handbook of Statistics on Indian Economy, 2006, RBI.

The turnover ratio decreased from 51.44 percent in 1990-91 to about 27 percent in 2006-07. The mean value of the ratio over the whole period is 46.16. During first period of analysis, this ratio was around 30% only and then it increased to 78.9% in the subsequent period and again it declined to 36.25%. The reason can be security market scam because of which the sentiments of the investors affected adversely. After 1995 market liquidity started rising again. The SEBI has taken various regulatory policies and initiatives to regulate the market. The liquidity again gets affected negatively in year 2001-02 because market was hit by another set of irregularities in the stock market.

Turnover of the stock market as compare to size of the market is at its maximum in the year 2000-01. This is the year when value traded ratio is also at highest level. Because of these values, the ratio of value traded and turnover is highest in the second sub-period. Thus liquidity of the stock market on an average has not increased. Analysis of the value traded ratio and turnover ratio reveals that the Indian stock market is less liquid in relation to the growth of the economy than growth of the market size. Second period of study shows the highest amount of trading in relation to size of the economy as well as in relation to growth of the market size.

Stock Market Volatility

In this section, the volatility of the Indian stock market during 1991-2007 has been analysed. It is examined whether there has been an increase in volatility in the Indian stock market on account of the process of financial liberalisation. Stock market liberalization has attracted a new group of investors viz. the FIIs. An increase in the number of traders in the market may then reduce the stock price variance. Stock market opening may also simultaneously trigger an increase in the variance of information sets available to the FIIs thereby implying a possibility of an increase in the stock return volatility. The following table shows the Volatility Ratio of the Indian corporate sector.

Table 4: Yearly Volatility Ratio of Indian Stock Market

Year	Volatility Ratio (%)
1990-91	3.75
1991-92	8.05
1992-93	3.86
1993-94	3.30
1994-95	2.13
1995-96	3.46
1996-97	3.26
1997-98	3.75
1998-99	3.72
1999-00	4.82
2000-01	4.31
2001-02	2.43
2002-03	3.36
2003-04	3.17
2004-05	2.75
2005-06	2.74
2006-07	2.81
Year	Volatility Ratio
1990-07	3.63
1990-97	3.97
1997-02	3.80
2002-07	2.96

Note: Volatility is calculated as the standard deviation of the natural log of returns in indices for the respective period.

Analysis of stock index volatility reveals that the period around 1991 is the most volatile period in the stock market due to the Balance of Payment crisis and the subsequent initiation of economic reforms in India. During 1991-92 the value of volatility ratio is as high as 8.05 whereas Mean standard deviation of the study period is 3.63. In the initial sub-period of liberalisation i.e., 1991-97 the ratio is at 3.97 because of the announcement of first phase of reforms. It shows a consistent fall in second and third sub-periods to 3.80 and 2.96 respectively. There has been a marked fall of around 25% between the volatility levels over the first and third sub-periods of the study. The second highest volatile year was 1999-00 when the ratio was 4.82. During the study period the volatility of the Indian stock market has not shown any significant pattern on a year-to-year basis although it has continuously decreased over the three sub periods.

As regards the level of volatility, mean volatility in the post liberalization period shows a temporary increase followed by a decrease on a yearly basis in cycles even though the change in most cases is marginal. This was due to the increase in the FII activity in the Indian stock market during the period.

Analysis also shows that stock market cycles in India have not intensified after financial liberalization. A generalized reduction in instability in the post reform period in India has been observed.

Conclusion

Results of the study show that capital market reforms that started in 1990s contributed to the development in the stock markets in India. This study has found significant improvement in the economy after liberalisation. All indicators, show improvement in stock market activities in the post liberalisation period. Market capitalisation ratio, value traded ratio, and turn over ratio have increased. These indicators together with decline in volatility are an evidence of stock market development in India. Infrastructure improvements in the stock market like the introduction of screen based on-line trading system, setting up of National Securities Clearing Corporation (NSCC) in 1996, the setting up of depositories in India and the introduction of trading in financial derivatives in 1999 may have contributed to the improvement in the stock markets.

Analysis reveals that liberalization of the stock market or the FII entry in particular does not have any direct implications for the stock return volatility. However, it had affected the size and liquidity of the stock market. The primary Indian capital market has grown significantly since the beginning of capital market reforms. The secondary capital market is also found to have grown in terms of its size and liquidity. Volatility in stock prices is found to have declined annually.

Table 5: Correlation Coefficient among Indian Stock Market Development Indicators

	Market Capitali- sation Ratio	Value Added Ratio	Turnover Ratio	Volatility Ratio
Market Capitalisation Ratio	1.0000			
Value Traded Ratio	.2452	1.0000		
Turnover Ratio	-.3268	.8104**	1.0000	
Volatility Ratio	-.4099	.1308	.3463	1.0000

***Correlation is significant at 1% level*

Statistical analysis shows that the correlation among different stock market development indicators is not statistically significant except the coefficient of correlation between Turnover ratio and Value Traded Ratio which is showing very high degree of positive relationship and significant also. From above it is clear that size of the market and its volatility are negatively correlated to some extent. As the size of the

market increases, the volatility reduces in the market. Size and liquidity of the market are positively related but degree of relationship is very poor. Liquidity and volatility are showing less degree of association but positively related in Indian stock market.

Thus the stock market (primary and secondary) has grown over time. The stock market efficiency has improved significantly after initiation of reforms in 1991. Stock market has also increased rapidly in terms of size and liquidity. Volatility of the market had declined. After the securities market scam during 2000-01, investors lost confidence on the market. The size of the market still increased in absolute terms but liquidity decreased and volatility increased during the study period mainly because of passive conditions prevalent in the primary market and secondary market.

Analysis reveals that liberalization of the stock market or the FII entry in particular does not have any direct implications for the stock return volatility. However, it had affected the size and liquidity of the stock market. The primary Indian capital market has grown significantly since the beginning of capital market reforms. The secondary capital market is also found to have grown in terms of its size and liquidity. Volatility in stock prices is found to have declined annually. Reforms in general lead to a structural shift in the volatility in India. In all the phases, the period between April 1991 and March 1992 is the most volatile period with the standard deviation of stock returns exceeding that in the other periods. Volatility has declined in the post liberalization phase. Significant developments in the market indicators-turnover or market capitalization do not lead to volatility shifts in the stock returns.

Endnotes

1. For the purpose of this paper the term developing markets and emerging markets are interchangeable.
2. Broad based market index is frequently used as proxies for market (Gupta and Donleavy, 2009). BSE 100 is a better representative of the market as compared with BSE Sensex because BSE Sensex is based on only 30 stocks.
3. American Depository Receipts (ADRs) are negotiable instruments issued by U.S. banks for a predetermined number of shares in a foreign stock. ADRs are denominated in US dollars and listed and traded on a U.S. exchange without the need for the foreign stock being listed on U.S. stock exchange.

References

- Aggarwal, R., Inclan, C. and Leal, R.P.C. (1999), "Volatility in Emerging Stock Markets", *Journal of Financial and Quantitative Analysis*, Vol. 34, No. 1, pp.33-55.
- Beckers, S. (1983), "Variance of Security Price Returns based on High, Low and Closing Prices", *Journal of Business*, pp.97-112.
- Bencivenga, V.R., Bruce, D.S. and Ross, M.S. (1996), "Equity Markets, Transaction Costs, and Capital Accumulation: An Illustration", *The World Bank Economic Review*, Vol. 10, No. 2, pp.371-96.
- Biswal, P.C. and Kamaiah, B. (2001), "Stock Market Development in India, Is There Any Trend Break?", *Economic and Political Weekly*, Vol. 36, No. 4, pp.377-384.
- Bhaduri, S. (2000), "Liberalisation and Firm's Choice of Financial Structure in an Emerging Economy: The Indian Corporate Sector", *Development Policy Review*, Vol. 18, pp.413-434.
- De Santis, G. and Imorohoroglu, S. (1997), "Stock Returns and Volatility in Emerging Financial Markets", *Journal of International Money and Finance*, Vol. 16, No. 4, pp.561-579.
- Demirgüç-Kunt A. and Levine, R. (1996), "Stock Market Development and Financial Intermediaries: Stylised Facts", *World Bank Economic Review*, Vol. 10, No. 2, pp.291-321.
- Hicks, J.R. (1969), *A Theory of Economic History*, Clarendon Press, Oxford, U.K.
- Husain, F. and Qayyum, A. (2006), "Stock Market Liberalisations in the South Asian Region", PIDE Working Paper No. 06.
- Jones, C.P. and Wilson, J.W. (1989), "Is Stock Price Volatility Increasing?", *Financial Analysts Journal*, Vol. 45, No. 6, pp.20-26.
- Kim, E.H. and Singal, V. (2000), "Stock Markets Openings: Experience of Emerging Economies", *Journal of Business*, Vol. 73, No. 1, pp.25-66.

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Kyle, A.S. (1984), "Market Structure, Information, Futures Markets and Price Formation", in Storey, G.G., Schmitz, A., and Sarris, A.H. (eds.), *International Agricultural Trade: Advanced Readings in Price Formation, Market Structure, and Price Instability*, Colo: Westview, Boulder, pp.45-64.

Levine, R. (1991), "Stock Markets, Growth and Tax Policy", *Journal of Finance*, Vol. 46, No. 4, pp.1445-1465.

Levine, R. and Zervos, S. (1996), "Stock Markets, Banks and Economic Growth", Policy Research Working Paper No. 1690, World Bank.

Schwert, G.W. (1989), "Why Does Stock Market Volatility Change Over Time?", *Journal of Finance*, Vol. 44, No. 5, pp.1115-1153.

Sen, K. and Vaidya, R. (1999), *The Process of Financial Liberalisation in India*, New Delhi: Oxford University Press.

Stiglitz, J.E. (1993), *The Role of the State in Financial Markets*, in *Proceedings of the World Bank Annual Conference on Development Economics*, pp.19-52.

World Institute for Development Economics Research (WIDER), (1990), "Foreign Portfolio Investment in Emerging Markets", WIDER Study Group Series, No. 5.