Impact of Pre and Post Budget on Stock Market Volatility Between 2001 to 2011

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ABSTRACT

The stock market is witnessing heightened activities and is increasingly gaining importance. In the current context of globalization and the subsequent integration of the global markets this paper captures the trends, similarities and patterns in the activities and movements of the Indian Stock Market from 2002 to 2011. This paper explores the impact of budget on stock market volatility and analyses how returns vary with it. Another important analysis done is to find the volatility of different months for a period of ten years for four major indices in India. Analysis of BSE, NSE market capitalisation is also done. The main aim is to help investors gain knowledge about volatility present in different months, thereby they can invest cautiously. Thus, this study helps the investors to minimize their overall risk and maximize the return of their investment over any period of time.

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Introduction

The economic and political changes occurring locally and globally influence the share price movements and show the state of stock market to the general public. The issues of return and volatility have become increasingly important in recent times to the Indian investors, regulators, brokers, policy makers, dealers and researchers with the increase in the FIIs investment. In the past few years Indian capital market has undergone tremendous reform. Every segment of Indian capital market namely primary secondary and derivative has experienced tremendous change. Indian capital market has been recognised as one of the most transparent, efficient and clean market. In the recent years there has been a perception that the volatility has gone up. Volatility is an important indicator of fluctuation of stock market prices. This will scare investor away from the stock market. It is essential for the investors to know the variation in the stock market from time to time and understand the changing pattern of the capital market prices, in order to buy/sell the securities. The present study is aimed at examining the pattern, trends, causes and volatility of the stock market.

Theoretical framework

Antoniou, A., Holmes P. (1995), examined the impact of trading in the FTSE-100 Stock Index Futures on the volatility of the underlying spot market. The results suggest that futures trading have led to increased volatility, but that the nature of volatility has not changed post-futures. The finding that price changes being integrated pre-futures, but being stationary post-futures, implies that the introduction of futures has improved the speed and quality of information flowing to the spot market. French. K., (1980), explained two alternative models of the process generating stock returns. Under the calendar time hypothesis, the process operates continuously, and since the return for Monday represents a three-calendar day investment, the expected return for Monday be three times the expected return for other days of the week Under the trading time hypothesis. During most of the period studied, from 1953 through 1977, the daily returns to the Standard and Poor's composite portfolio are inconsistent with both the trading time and the calendar time models Surprisingly, although the average return for the other four days of the week was positive, the average return for Monday was significantly negative during each of five years periods. Kaur, (2004) said that few studies have examined the day-of-the-week effect in the Indian stock market, and further notes the absence of studies that examine monthly seasonality in the Indian stock market. Kaur utilized two Indian stock indexes, the Bombay Stock Exchange (BSE) 30 index and the National Stock Exchange (NSE) S&P CNX Nifty stock index, to examine the day-of-the-week effect and the monthly effect. Kaur did not find a January

effect in the Indian stock market, but did find that March and September generated substantially lower returns, whereas February and December generated substantial positive returns. Fountas and Segredakis, (2002) investigated monthly seasonal anomalies in eighteen major emerging equity markets, including the Indian stock market. They examined the monthly effect for the period January 1987 to December 1995. For the Indian stock market, they found August returns were significantly greater than April, May, October and November returns. However, they did not find evidence consistent with hypothesized tax-loss selling in the Indian stock market, as the tax-year in India commences in April. Raju, M.T., anirban ghosh, (2004), studied price discovery and volatility in the context of introduction of Nifty futures at the National Stock Exchange (NSE) in June 2000. Co integration and Generalised Auto regressive Conditional Heteroscedasticity (GARCH) techniques were used to study price discovery and volatility respectively. The major findings are that the futures market (and not the spot market) responds to deviations from equilibrium; price discovery occurs in both the futures and the spot market, especially in the later half of the study period. The results also show that volatility in the spot market has come down after the introduction of stock index futures. Edwards, (1988), studied whether stock Index futures trading destabilised the spot market in the long run. Using variance ratio F tests for the period June 1973 to May 1987, he concluded that the introduction of futures trading did not induce a change in spot volatility in the long run. Gregory et.al., (1996), examined how volatility of S&P 500 Index futures affects the S&P 500 Index volatility. Their study also examined the effect of good and bad news on the spot market volatility. Volatility was estimated using EGARCH model. They found that bad news increased volatility more than good news and the degree of asymmetry was higher for futures market. Kamara, (1992), examined the influence of innovations in the rate of productive activity, unanticipated changes in the default risk premium, unanticipated changes in discount rate, unanticipated price level changes and changes in expected inflation on the volatility for the pre future and post future period. The results indicate that the increase in volatility in the post futures period cannot be completely attributed to the introduction of futures trading. Hammoudeh and Li (2008) explained the sudden changes in volatility in emerging markets i.e. five Gulf area Arab stock markets. The study has found that most of the Gulf Arab stock markets were more sensitive to global events compared to local or regional events. This finding is in sharp contrast to the study of Aggarwal et al. (1999), which found dominance of local events in causing large shifts in volatility.

Li et al. (2005), said the relationship between expected stock return and volatility based on parametric EGARCH- M model. They found a

positive but insignificant relationship between stock return and volatility. By using semi parametric specification of conditional variance, they found a significant negative relationship between expected return and volatility in six out of 12 markets during January 1980 to December 2001. Leon Konan, (2008), investigated the effects of interest rates changes on the stock market returns and volatility in Korea using weekly returns on the KOSPI 200 and the NCD 91-day yield over the period from 31 January 1992 to 16 October 1998.The result indicate, that interest rates have a strong positive power for stock returns, and a weak predictive power for volatility.'

Gupta and Kundu (2006) analyzed the impact of Union Budgets on stock market considering the returns and volatility in Sensex. They found that budgets have maximum impact in short- term post-budget period, as compared to medium term and long term average returns and volatility does not generally increase in a post- budget situation as the time period increases. Upadhyay Saroj (2006), examined that Foreign Institutional Investors (FIT) participation in the Indian Stock Market triggers its upward movements, but at the same time, increased liquidity through FIT investment inflow increases volatility too. Porwal and Gupta (2005), explained the hot issue of volatility in the Indian stock markets. The study is based on daily prices of S&P CNX Nifty for the period of 10 years .They found that the year1996 was the most volatile year in the past 10 years; this was due to the political instability and absence of proper regulation. Verma and Agarwal (2005), explained the deal with an event study- using budget as an event window for 4 years. It compares the returns on CNX nifty index prior to and subsequent to the budget to assess the impact of the event. The findings of the study indicate that the event have a significant impact on the stock market. Mohanty (2004), examined the stock price reaction to announcement of various policy issues by government of India. The result show that the stocks generally react to public news quite quickly, but the first adjustment is not always the correct one. Thomas and Ajay (2002) explored the interplay between the Union Budget and the stock market and concluded the stock market appears to be fairly efficient at information processing about the Union Budget.Rao (1997) studied the impact of macroeconomic events like union budgets and the credit policy announcements on stock prices from 1991-1995. He found that budgets increased the volatility of stock prices of the market portfolio. However, the credit policy announcements were found to have no impact on stock price behaviour.

Objectives of the Study

The perception related to the dispersion of Indian stock prices varies. There is a need for a study on volatility in Indian stock markets after 2001 to see whether changes in regulation by SEBI have resulted in changes in volatility pattern. The level

of investor, frequent and wide stock market variations cause uncertainty about the value of an asset and affect the confidence of the investor. Risk adverse investors may shy away from market with frequent and sharp price movements. An understanding of volatility over a period of time is important from the point of view of individual investors. Based on these aspects, the study has the following objectives

- The main objective of the study is to research upon the volatility of four major indices of Indian stock market and the effect of budget on the volatility of stock market from 2002-2011
- To know which stock market NSE or BSE indices are highly volatile from 2002-2011.
- To analyse the reasons for the volatility.
- To compare the degree of volatility of indices of NSE and BSE from 2002-2011.
- To examine the impact of union budget on the stock market in terms of volatility from 2002-2011.
- To examine the turnover of NSE and BSE from 2002 to 2011.
- To examine the volatility of NSE and BSE from 2002 to 2011.

Methodology

The research design is descriptive in nature as the variables are already known.

The study is based mainly on secondary data which have been collected from various websites. The closing prices of NIFTY, NIFTY JUNIOUR, SENSEX and BSE 100 have been collected from the official website of NSE and BSE. The study period spans from April 2001-02 to march 2010-11. During this period various reforms have taken place in the capital market by SEBI to protect the investor. This period includes a total of 9 budgets and it has been presented by various Finance Ministers in the Parliament. A total of 60 trading days before and after the budget has been considered to study the impact of budget. This has been done on an assumption, that an impact of budget on share price can be identified on its own for a maximum of 30 days beyond which many other causes may distort the said effect. The secondary data have been analysed using the following statistical tools

- Standard deviation
- Co-efficient of variance
- Return from index

The Return is calculated using logarithmic method as follows.

Where R_t = log ($p_t$log p_{t-1})*100

R_t = Market return at the period t

P_t = Price index at day t

P_{t-1} = Price index at day $_{t-1}$ and

log = Natural log

Volatility is measured by using the formula given by Fisher and Jordan (1993)

$$\text{Volatility} = \frac{\text{High - Low}}{\frac{1}{2(High + Low)}}$$

Analysis and discussion

Budget Effect on Stock Market

The stock market's response to a Budget is often viewed as an important summary statistic of the 'quality' of a Budget in terms of improving macro economic prospects. The Budget decides the future course of Indian economy as well as stock market. The measures undertaken by the Government in the Budget affects companies as it outlines changes in the taxes (like excise duty, import duty), FDI limit in different industries. These changes, favourable or unfavourable, eventually get reflected in the stock prices of related companies.

Table 1.1 : Return on NIFTY

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2009-10	2010-11
pre- budget	-0.06	0.55	0.14	0.05	0.11	0.2	-0.51	-0.51	-0.28
post budget	-0.57	-0.25	-0.41	0.44	-0.29	0.46	-0.1	-0.43	0.63

From the table, it is evident that the stock market has posted negative return post-budget except in the year 2004, 2006 and 2009. However, pre-budget, markets generally rendered mixed or marginally positive returns based on the investors' expectation. Further, examining the extent to which the stock market response to the Union Budget, it is during the post budget that the volatility in the stock market is higher in comparison to pre budget.

Table 1.2 : Volatility of NIFTY

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2009-10	2010-11
pre- budget	1.23	1.23	0.74	1.4	0.6674	0.67	1.17	1.73	2.25
post budget	2.14	0.81	0.88	0.79	0.7389	0.86	1.86	2.71	1.55

Table 1.3 : Daily Average Returns

Year	Name of the Indices	Minimum Index level	Maximum Index level	Daily Average Return
2001-2002	Nifty	1124.70	1624.65	-0.09435 %
	Sensex	3540.65	5541.54	-013788%
2002-2003	Nifty	854.20	1198.45	0.00317 %
	Sensex	2600.12	3742.07	-0.01129%
2003-2004	Nifty	922.70	1146.5	-0.05239 %
	Sensex	2834.41	3512.55	-0.05568%
2004-2005	Nifty	924.30	1982.15	0.24440 %
	Sensex	2924.03	6194.11	0.23833%
2005-2006	Nifty	1388.75	2168.95	0.06813 %
	Sensex	4505.16	6915.09	0.04923%
2006-2007	Nifty	1902.5	3418.95	0.20754%
	Sensex	6134.86	11307.04	0.21580%
2007-2008	Nifty	2632.80	4224.25	0.04663%
	Sensex	8929.44	14652.09	0.05002%
2008-2009	Nifty	3633.6	6287.85	0.08534%
	Sensex	12455.37	20873.33	0.09192%
2009-2010	Nifty	2252.75	5298.85	-0.00149%
	Sensex	7,697.39	21,206.77	-0.00231%
2010-11	Nifty	2965.7	5329.55	0.002446%
	Sensex	8,047.17	17,530.94	0.002534%

During 20012002 the Indian economy decelerated and the Nifty and the Sensex yielded negative return of 0.09435 per cent and -0.13788 per cent respectively. There was a large sell off in new economy stocks in global markets. This brought down the Nifty from the height of 1636.95 in April, 2001 to the lower level of 1108.20 in October, 2001 and the Sensex from 5426.82 in April, 2001 to 3689.43 in October, 2001, The growth rate of GDP and the industrial sector declined from 6.4 per cent to 6 per cent and from 6.6 per cent to 4.9 per cent respectively. Within the industrial sector, the growth rate of manufacturing sector declined to 5.2 per cent and the infrastructure sector also registered a lower growth as compared to that of the previous year.

The earth quake in Gujarat, rising oil prices, devaluation of rupee against dollar, rising interest rates and inflation, the proposal to increase the tax on distribution of dividend by companies and by MFs from 10 per cent to 20 per cent had a negative effect among corporate. Scams over and again proved the vulnerability of the regulatory network and system of the finance and capital markets in that year. Several stockbrokers grossly misused the finance given to them by investors. FIIs investment was very low that year. The above cited reasons were the major reasons for the negative returns.

The year 200203 recorded positive return of 0.00317 per cent but Sensex had negative return of -0.01129 per cent. The introduction of rolling settlement and derivatives encouraged FIIs and domestic investment even though markets were affected by riots in Gujarat, cyclone in Orissa, suspension of repurchase facility under UTI's US 64 scheme and the attack on the World trade Centre, Indian Parliament and Jammu and Kashmir Assembly.

The year 200304 recorded negative return of 0.05239 per cent and -0.05568 per cent in the Nifty and Sensex respectively. Failure of the monsoon, bomb blast in Mumbai, the war between IndoPak border and tussle between US and Iraq had negative impact on the stock market. In June and October 2002, the FIIs turned as net sellers, and their investments were Rs.8660 million and Rs.8757 million respectively. In that year a total of Rs.4070 crores were mobilised as against Rs.7543 crore in 200203. Banks and financial institutions were the main mobilisers during the year. All these factors led to the negative return in the Nifty and Sensex.

The daily average return in the Nifty and the Sensex was the highest in the year 200405. Strong economic fundamentals exhibited fall in interest rates, strong GDP growth rate, increase in foreign exchange reserves and exports of Indian companies doubled the Nifty and the Sensex in the first three quarters. Further, the large expenditure by the Government on infrastructure sector and the reform process enhanced the morale and motivation levels of Corporate India which in turn boosted the stock market returns. The SEBI's ban on the Participatory Notes issued by unregulated entities made the markets more disciplined and investor friendly. In addition, the introduction of T+2 settlement cycle and the derivatives in CNX.IT index, the margin system and the improved surveillance in the exchanges were also the reasons for the increased return.

There was a decline in the return in the year 20052006. As the index value of the Nifty sharply came down from 1892.45 and 5925.58 respectively on 23rd April 2004, to 1388.75 and 4505.16 respectively in May, 2005, a lower circuit breaker was applied on the NSE for the first time. This brought a total halt to all trading and the fund flow to stock market from the retail investors and the Foreign Institutional Investors dwindled. They were net sellers in May 2004. But, slow decline in Chinese economy, tax exemption on long term capital gain, and tax reduction on short term gain, the appreciation of rupee against the US dollar, low returns of bank FD rate and insurance policies and negative returns of debt market mutual funds prevented the negative return.

The overall performance of the stock markets in the world was good. By 2006, India's growth story was well established. Money started pouring in from everywhere. A new industrial resurgence; a pickup in investment; modest inflation in spite of spiralling global crude prices; rapid growth in exports and imports with a widening of the current account deficit; laying of some institutional foundations for faster development of physical infrastructure; progress in fiscal consolidation; and the launching of the National Rural Employment Guarantee (NREG) Scheme for inclusive growth and social security increased the return in the year 2006-2007. And the biotech sector was growing at 37.42 percent and inched closer to US$ 1.5 billion in revenues during fiscal year (April 1 to March 31) 2006-07. The GDP growth rate was 9.4%.In respect of the household sector, the saving in the form of financial and physical assets has gone up from Rs. 4,208.41 billion and Rs. 4,459.15 billion in 2006-07. All these factors boosted the Indian stock market scales. Two things have happened in this period to push the market to uncharted territory. One is a robust inflow of foreign money, as more and more FIIs have rushed to pump money into the Indian market. The number of new FIIs registered during the year also went up significantly.

Again there was a decline in the market return in the year 2007-2008. Global crude oil prices were surging yet again and had touched $78 a barrel due to the tensions in West Asia and the hurricanes from the Atlantic into the US east coast of the year further surged in crude prices and oil production and refinery output were disrupted in the affected area. Global liquidity had almost been drained off following the rate increases in the US, Europe and in Japan. The RBI had also done its bit in doing the same in India and a further movement in that direction could not have, but had an adverse impact on the stock market. FII flows in 2007, at about $8.5 billion (around Rs 38,000 crore), were lower by 20 per cent than in 2006. But this was due to the markets tanking in May and June. Pharma, ferrous metals, FMCG, oil and gas, and auto components did perform well in that year.

The year 2008 saw Indian stock markets scaling new peaks. During 2008-09 the secondary market

rose with Sensex and Nifty rising by 47.1 and 54.8 per cent respectively. Amongst NSE indices, both Nifty and Nifty Junior delivered record annual equity returns of 54.8 per cent and 75.7 per cent respectively during the calendar year. The Indian financial sector was on a roll. It has emerged as the third best performing market in the world with a dollar return of 71.23 per cent. The popular Bombay Stock Exchange (BSE) benchmark index, SENSEX, also posted its highest ever absolute gain of 6500 points in over two decades. Simultaneously, the National Stock Exchange (NSE) climbed to the top spot in stock futures contracts and number-two slot in the index futures segment in the world.

Table 1.5 : Turnover of NSE and BSE during the study period (2002-2011)

NSE	Turnover	% change	BSE	turnover	% change
2001-02	2413510		2000-01	1000030	
2002-03	513167	-78.7377	2001-02	304898	-69.5111
2003-04	6,17,988	20.42629	2002-03	313584	2.848822
2004-05	1099533	77.92142	2003-04	503290	60.49607
2005-06	1140072	3.686929	2004-05	518715	3.064833
2006-07	1569558	37.67183	2005-06	816074	57.32608
2007-08	1945285	23.9384	2006-07	956186	17.16903
2008-09	3551038	82.5459	2007-08	1578855	65.12007
2009-10	27,52,023	-22.5009	2008-09	11,00,074	-30.3246
2010-11	41,29,214	50.04286	2009-10	13,78,809	25.33784
Mean	1973139		Mean	847051.5	
SD()	1226006		SD()	437555.1	
CV	62.13478		CV	51.65625	

Turnover of NSE and BSE are shown above. It is observed that the turnover of stock exchanges directly or indirectly influences greater volatility of stock prices. Turnover also indicates depth of the market. Turnover will also increase the business activity of the stock exchange. Turnover of NSE and BSE are

rising gradually but more predominantly in NSE. During 2002-03 there was a crash in the market prices and the turnover change is -78.73 and -69.51 in NSE and BSE respectively. This was due to the stock market scam during that period. In 2009-10 the performance was quite disappointing. Due to the US sub-prime mortgage problem that spread over to India in the third quarter of 2009-10. The low levels of turnover in BSE can be interpreted as characterised by low levels of trading activities in comparison to NSE. High turnover of NSE may be due to its transparency, technological sophistication, and also may be due to the efficient payment and settlement framework. In 2008-2010 due to sub-prime crisis there was a decrease in market capitalisation. From the values of co-efficient of variation is higher for NSE.

Table 1.5 Market Capitalisations of NSE and BSE during the period 2002-2011

NSE	Market Capitalization	% Change	BSE	Market Capitalization	% change
2001-02	9247468		2000-01	8555791	
2002-03	6966767	-24.663	2001-02	6531011	-23.6656
2003-04	73,98,448	6.196289	2002-03	7224801	10.62301
2004-05	10661885	44.10975	2003-04	11526163	59.53606
2005-06	1585585	-85.1285	2004-05	1698428	-85.2646
2006-07	2813201	77.42354	2005-06	3022189	77.94037
2007-08	3345041	18.90515	2006-07	3545041	17.30044
2008-09	4858122	45.23355	2007-08	5138014	44.93525
2009-10	28,96,194	-40.3845	2008-09	30,86,075	-39.9364
2010-11	60,09,173	107.4852	2009-10	61,65,619	99.78837
Mean	5578188		mean	5649313	
SD	3000359		SD	2986673	
CV	53.78734		CV	52.8679	

The mean market capitalisation of NSE and BSE are 5578188 and 5649313 respectively. It is observed that the mean capitalisation of BSE is slightly greater than that of NSE. The capitalisation of stock market is influenced by the price movement in the market. If the stock prices are bullish the market capitalisation will increase proportionately in relation to the price change. It is seen that the market size of Indian capital market is increasing over the years except in 2001-03, 2005-06, and 2009-10. Decline in market capitalisation in 2001-02 was due to stock market scam. Due to sub-prime crisis there was a decrease in market capitalisation in 2009-10. From the values of co-efficient of variation and standard deviation, we observe that the market capitalisation of NSE is slightly more volatile compared to BSE.

The month of May showed highest volatility in an average, followed by October. This is followed by April and March in all the four indices. The reason for April and May month volatility is due to announcement of financial result by the companies, so investor tend to buy or sell according to the financial performance of the companies. Another reason for this volatility is that budget implication start to work during this period of the year.

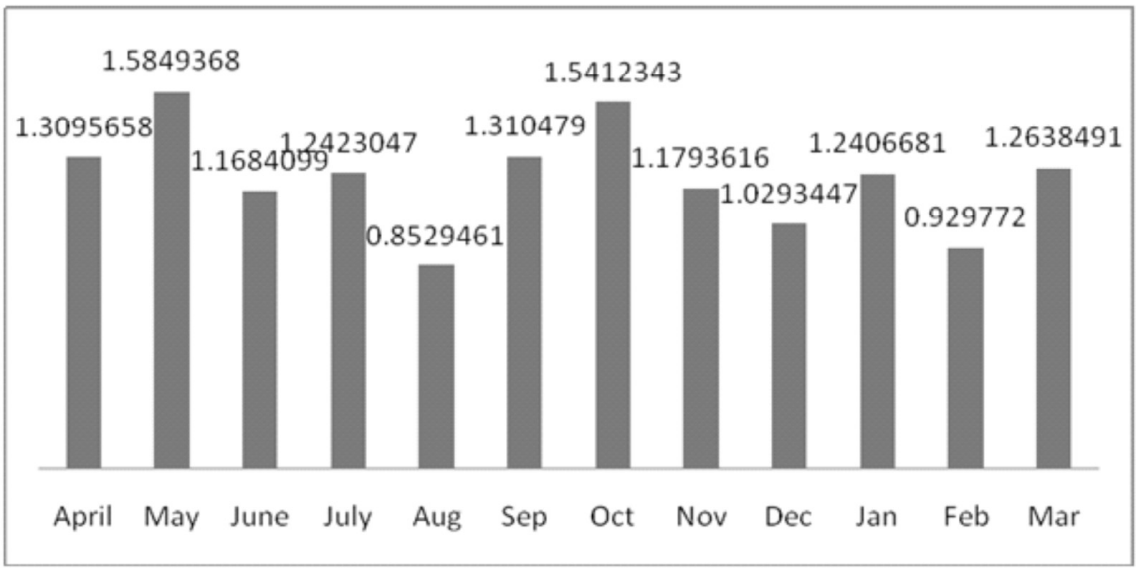

Fig 1.1 Monthly Volatility of SENSEX

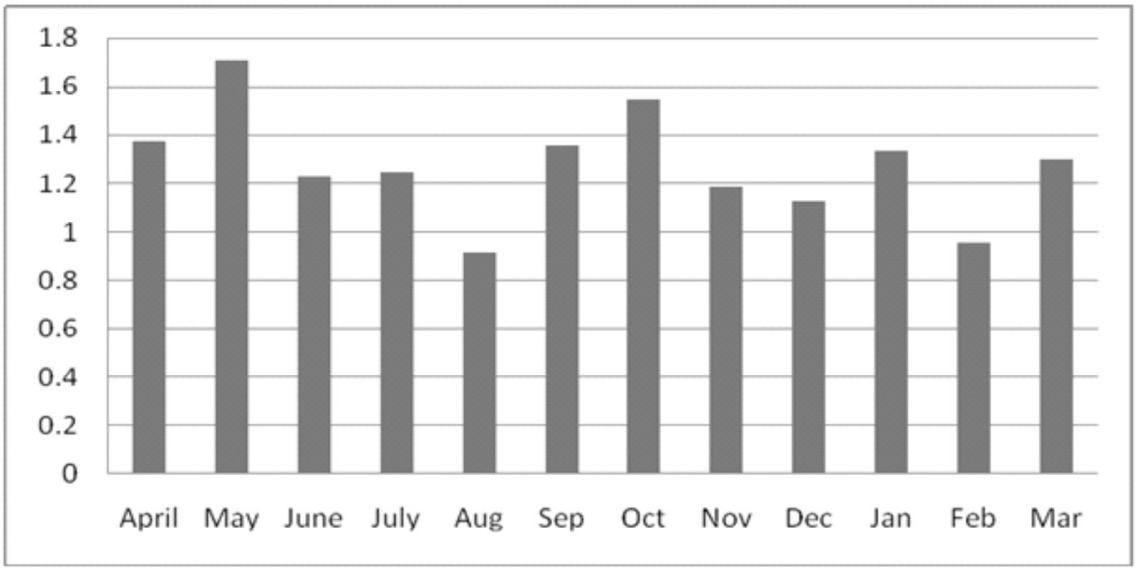

Fig 1.2 Monthly Volatility of BSE 100

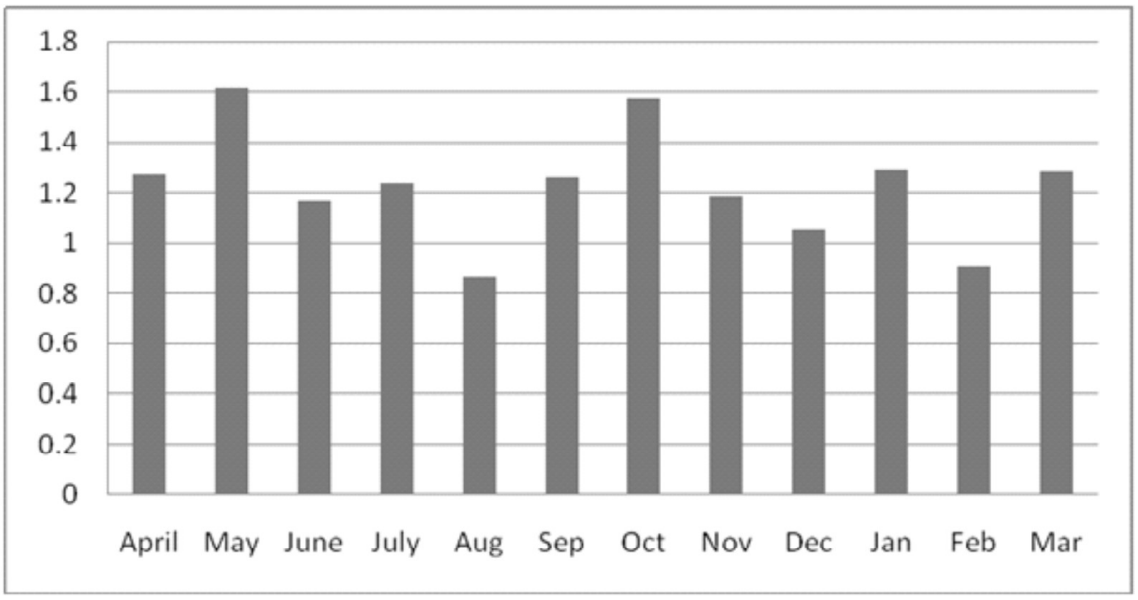

Fig 1.3 Monthly Volatility of NIFTY

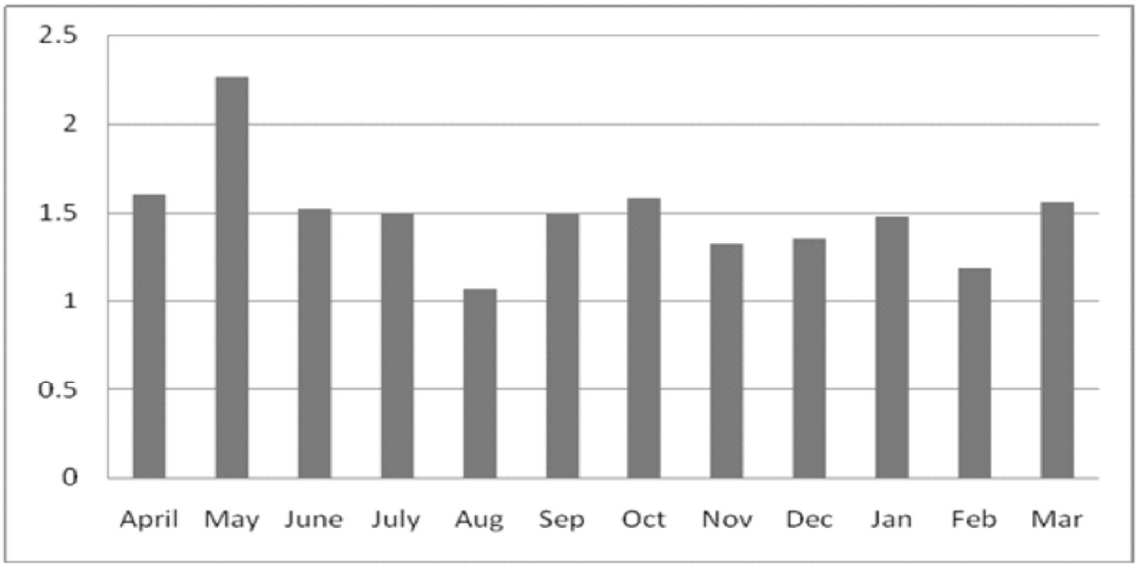

Fig 1.4 Monthly Volatility of NIFTY Junior

Results

- In most of the past years, it is evident that the stock market has posted negative return post-budget except in the year 2005, 2007 and 2010. However, pre-budget, markets generally rendered mixed or marginally positive returns based on the investors' expectation. Most of the times the expectation of the investor is not met by the budget, so there is always negative return after the budget.
- By examining the extent to which the stock market responds to the Union Budget, it is during the post budget that the volatility in the stock market is higher in comparison to pre budget since based on the budget people tend to buy or sell share accordingly so there is high volatility after the announcement of budget.
- Month of May showed highest volatility followed by October and March showed high volatility. During the month of April companies announce their financial results. Investors buy and sell shares by analysing the financial result. Budget implication will start to work from April onwards so there is more volatility around this part. So this might be the reason for the volatility in May month.

- The values of co-efficient of variation and standard deviation pertaining to the market capitalisation of NSE are slightly more volatile when compared to BSE.
- High turnover of NSE may be due to its transparency, technological sophistication, and due to the efficient payment and settlement framework.
- During the stock market scam and global financial crisis there is a fall in the market capitalisation as well as in the indices.
- SENSEX and BSE 100 have higher standard deviation while compared to NIFTY and JUNIOR NIFTY in yearly analysis of the indices.
- Daily average return follows similar trend in NSE and BSE. But daily average return of SENSEX is comparatively higher than NIFTY.

Implications for practitioner

- As there is a predominantly negative return after the budget its better not to invest in the share for very short term holding during the post budget period, as there is very low return and high volatility.
- Investors with little experience should be careful in highly volatile months like May, October.

Conclusion

Return of the indices after the budget is negative when compared to pre budget and also there is higher volatility during the post budget period. So investor should be cautious while investing for very short term investment and also while doing intraday trading during the budget period. Considering the monthly volatility of all the four indices month of May followed by October and April showed higher volatility. By comparing the turnover of NSE and BSE there is high turnover in NSE from which we can infer that it may be due to its transparency, technological sophistication, and after all may be due to the efficient payment and settlement framework. So investors can trade in NIFTY with much easy. The values of co-efficient of variation and standard deviation pertaining to the market capitalisation of NSE are slightly more volatile when compared to BSE.

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