# Stock Market movements across Sectors

In the financial year so far, the Sensex moved from 20,273 on 1st April 2013 to 21,080 on 20th December 2013. In the given period, the Sensex hit a high of 21,326 and a low of 17,906 points (all closing indices). Reckoned from the beginning of the year, the swing was as much as 11.6% to the lowest level and 5.2% to the highest level.

The overall economic fundamentals have been relatively weak in the current financial year. Structural bottlenecks, slow policy movement, high inflation, declining industrial growth, subdued demand for both consumption and investment, depreciating currency and high inflation rate have resulted in downbeat sentiments. Growth projections for the year vary between 4-5.5% from various forecasters which include government agencies against 5.5-7.5% at the beginning of the year. Corporate results too have not been too encouraging with studies indicating pressure on profit margins. The global environment has been shaky at the prospects of the tapering programme of the Federal Reserve.

On the positive side there have been some encouraging policy announcements on clearance of projects, passing of some bills, some action on trying to bring in more FDI, strict control of the current account deficit, determined stance on controlling the fiscal deficit and perceived strong action by RBI on NPAs. However, movement in Sensex indices has been stable during the year. The trend as seen in the chart below is in the upward direction with troughs being witnessed in early April, June and mid-August.

Chart 1: Sensex Movement
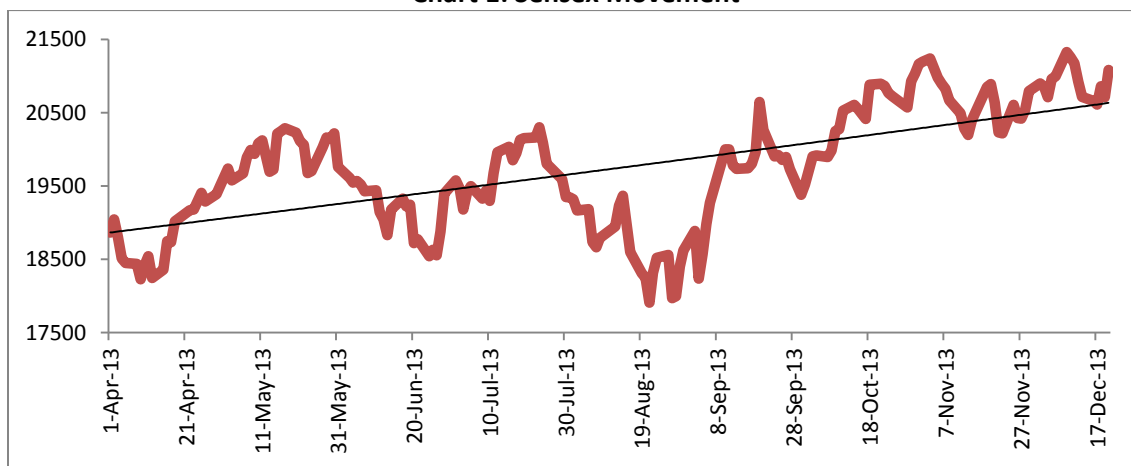
Source: BSE

The purpose here is to ascertain how the stock indices have moved across various sectors and categories. A hypothesis often believed is that the Sensex may not be very representative of the rest of the stocks as given the preponderance of these stocks in the market, they could be skewing the performance and that the other stocks do not show the same degree of buoyancy and optimism as the Sensex. Therefore, movement in other indices is mapped with those in Sensex to see if the movements are in sync. Sector specific indices as well as the mid and small cap indices have been analyzed here with respect to movements in the Sensex. The sector specific indices comprise a sample of between 10-15 scrips while the mid and small cap indices are much larger with samples of over 200 companies over 21 sectors.

Spread of Sensex across sectors

Table 1 provides the spread of the Sensex stocks across various sectors. As can be seen the finance sector dominates followed by IT, FMCG and Oil and gas. Intuitively the Sensex stocks could be driving the sectoral indices too though it would be limited to an extent as the other scrips would be affected by sector-specific developments. While the exercise looks at the sectoral indices which would have common scrips in the Sensex, the small and mid-cap indices have also been juxtaposed which would be largely independent of the Sensex scrips.

Table 1: Sectoral Composition

SENSEX/Sectors	Index Market Capitalization (%)
BSE SENSEX	100.00
Finance	25.46
Information Technology	17.99
FMCG	14.55
Oil & Gas	13.92
Transport Equipment	9.63
Healthcare	5.76
Capital Goods	4.51
Metal Products & Mining	3.54
Power	2.37
Telecom	2.26

Source: BSE

Correlation Coefficient:

Table 2 below calculates the simple coefficient of correlation between absolute values of the Sensex and the other indices which include various sectors as well as the small cap and mid-cap indices. As this correlation looks at only the absolute levels, they indicate whether there is association of these levels with one another and do not track direction or magnitude of change.

Table 2: Correlation with Sensex (Absolute nos.)

Sectors	Coefficient of Correlation
Auto	0.93
Metals	0.70
Oil & Gas	0.61
Small cap	0.57
IT	0.53
Capital Goods	0.50
Mid cap	0.47
FMCG	0.47
Power	0.34
Bankex	0.29
PSU	0.03
Reality	-0.13
Consumer Durables	-0.18

Source: BSE

These coefficients only match the levels of the absolute indices – a high coefficient of over 0.6 or 0.7 would mean that high values of Sensex are associated with high values of the other indices and vice versa.

- Auto sector's correlation is the highest at 0.93, indicating that Auto sector index levels are closely associated with those in Sensex
- Metals, oil & gas, small cap, IT and capital goods are among the other sectors which have high correlation with Sensex
- However, reality and consumer durables have negative correlation coefficient, indicating opposite direction in these indices and the Sensex.

Daily returns patterns

A more pertinent way of looking at the relation between these indices is to map the daily returns across all these indices. The results are provided in Table 3 below where the first differentials (though logs) are used to calculate returns. The results are interesting.

Table 3: Correlation with Sensex (logs)

Sectors	Coefficient of Correlation
Bankex	0.84
Oil & Gas	0.82
PSU	0.82
Mid cap	0.81
Capital Goods	0.80
Auto	0.78
Power	0.76
Reality	0.74
Small cap	0.74
FMCG	0.70
Metals	0.68
Consumer Durables	0.57
IT	0.39

Source: BSE

- Highest correlation is shown by Bankex, with coefficient of correlation of 0.84, followed by Oil & Gas and PSU both with coefficient of correlation of 0.82. Quite clearly these indices do follow closely the movements in Sensex.
- Mid cap, capital goods, auto, power, reality, small cap and FMCG are among the sectors which had coefficient of correlation above 0.70. This indicates generalized positive correlation with movements in the Sensex.
- Metals (0.68) and Consumer durables(0.57) also have relatively high correlation with Sensex
- IT sector index have low level of correlation with the Sensex. A reason could be the influence of global factors on this sector which would tend to be more significant compared with the same in the Sensex.
- The last three groups in the table, metals, consumer durables and IT also had relatively low correlation coefficients with the other sectors/groups.

Annualized daily volatility:

The stock markets have been quite volatile during the year and to capture this facet of the indices, the annualized daily volatility has been calculated for various indices for this period. Alongside, the annualized monthly volatility has been placed for some of the sectors for which comparable growth numbers are available through the IIP to ascertain whether the volatility in production was a factor influencing the volatility in share price movements for the same. (This exercise has limited scope as it is based on just 7 observations on a monthly basis and is not statistically well founded, but has been done only for the purpose of illustration).

Table 4: Annualized Volatility (%)

Sector	Daily annualized volatility	Monthly annualized volatility (IIP)
Reality	37.3	-
Bankex	33.2	-
Capital Goods	30.6	26.6
Consumer Durable	30.0	11.9
Metals	29.4	5.2
IT	24.8	-
Oil & Gas	24.5	-
Power	24.4	14.6
PSU	23.0	-
FMCG	22.5	12.5
Auto	21.6	22.3
Mid Cap	15.6	-
Small Cap	13.4	-
Sensex	**19.6**	**-**

Source: BSE and MOSPI

- Annualized daily volatility of Sensex stands at 19.6%, which was lower than that of all the individual sectors which had higher volatility. The two unrelated indices pertaining to small and mid-cap had lower volatility.
- Reality, Bankex, Capital goods and Consumer durables exhibit high daily annualized volatility (above 30%)
  - High volatility in capital goods indices could be explained by the high monthly volatility in the production of the same (26.6%)
  - However, the same does not hold in case of consumer durables where annualized monthly volatility was 11.9%
- Other sectors with high daily annualized volatility include metals (29.4%), IT (24.8%), oil & gas (24.5%), power (24.4%), PSU (23.0%) and auto (21.6%)
- Mid cap and small cap indices have been comparatively less volatile, with daily annualized volatility of less than the Sensex.

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