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"Are Indian Stock Markets driven by fundamentals?"

R. Sushama[1], Dr. V. Sudha[2]
[1]*(Department of Business Management, St.PiousX (MBA) College for Women, Hyderabad, India)*
[2]*(Department of Business Management, Osmania University, Hyderabad, India)*

Abstract: *As part of 15th anniversary celebration Moneycontrol.com brought performance of Nifty 50 over past 15 years and the results are mind boggling. It is quite revealing from tracking nifty performance that certain stock had outperformed in 15 years while others are under performer. It is interesting to notice that Nifty has witnessed major change and many stocks are no longer part of index then. Has the good/bad performance of the Nifty stocks got to do with the consistent/inconsistent performance of the companies behind the stocks? Or, has it got to do with the way the equities are approached and appraised by broader market participants, who are prone to fear and greed, leading to wide swings in returns for investors?Finding an answer to the above questions would not only help in putting things in perspective but would also help in deciding if it would really be prudent on investor's part to take the route of equities while deploying their savings ,with the aim of generating better returns. To find an answer to the above questions the various sources of equity returns have to be studied in detail.It will be interesting to study the returns generated by the Nifty 50 for the last 18 years.The aim of this study is to try and dissect the performance of the Nifty 50 into components, fundamental and speculative. The objective also is to study whether National Stock Exchange as measured in terms of its broader market index (Nifty 50) is fundamentally driven or speculative driven.*
Key words: *Total return, Fundamental return, speculative return, Dividend Yield, PE ratio.*

I. Introduction

"I really believe that you cannot use the stock market as a proxy for the economy."- Howard Schultz.

As part of 15th anniversary celebration Moneycontrol.com brought performance of Nifty 50 over past 15 years and the results are mind boggling[1]. 15 years back on November 9th 1999 Nifty was trading at 1364 points and on November 9th 2014 it closed on 8389 almost six times more. In 15 years Nifty gave 511% of absolute return and 12.83% of annualized return. It is quite revealing from tracking nifty performance that certain stock had outperformed in 15 years while others are under performer. The study of the Nifty performance had brought about three top stocks in last 15 years as follows:
ICICI Bankgave absolute return of 4869% over 15 years. If Rs. 1000 is invested in ICICI Bank before 15 years it would have been grown to Rs. 49,696.
HDFC Bankgave absolute return of 4836% over 15 years. If Rs.1000 is invested in HDFC Bank before 15 years it would have been grown to Rs.49, 366.
HDFCgave absolute return of 4065% over 15 years. If Rs.1000 is invested in HDFC before 15 years it would have been grown to Rs. 41,657.It is worth noting that all the three top performing stocks are from finance industry.

The same study had also brought about the three top losers in last 15 years which happens to be TVS Motors, MTNL & NIIT which gave -63%, -82% & -82% of absolute returns respectively. It is interesting to notice that Nifty has witnessed major change and many stocks are no longer part of index today.

Has the good/bad performance of the Nifty stocks got to do with the consistent/inconsistent performance of the companies behind the stocks? Or, has it got to do with the way the equities are approached and appraised by broader market participants, who are prone to fear and greed, leading to wide swings in returns for investors?

Finding an answer to the above questions would not only help in putting things in perspective but would also help in deciding if it would really be prudent on investor's part to take the route of equities while deploying their savings ,with the aim of generating better returns[2]. To find an answer to the above questions the various sources of equity returns have to be studied in detail and the irrationality of investors which is reflected in the stock market indices has to be examined.

II. Literature review

Investors' irrationality is an inevitable reality that has been time and again pointed out by researchers like Statman [3]. The researchers had focused on the fact that an actual investor cannot conform to the "rational" assumptions of the standard finance theories. They had argued that investors are not the calculative utility maximizing machines as the traditional theories believe them to be. Rather, they are led by their sentiments and are prone to make cognitive errors. They may lack self-control, can be over confident about their abilities, may miscalibrate information, and may also overreact or follow the crowd without thinking [4]. These errors can get projected in the form of market anomalies like speculative bubbles, for instance, the dot-com bubble of 1990's[5] and real estate bubble of 2006[6]. These events prove to be very costly in the stock market and they warrant the understanding of investment behavior, which has become important as ever. Thus, the need for comprehending such anomalies and shortcomings of human judgment involved with them became the precursor of behavioral finance. Behavioral finance deals with the influence of psychology on the behavior of financial practitioners and its subsequent impact on stock markets [7].

Objective of the Study:
To study whether National Stock Exchange measured in terms of its broader market index-Nifty 50 is fundamentally driven or speculative driven.

Hypothesis of the study
H_O: National Stock Exchange as measured in terms of its broader market index (Nifty 50) is not driven by speculations of the investors.

Scope of the study
The performance of Nifty 50 is studied for the period of 1999 to 2016 as the PE values of Nifty 50 were not available for the period before 1999.

III. Methodology

In the case of bonds, the returns are dependent only on one source under normal circumstances, which in itself is known beforehand, i.e., interest income but the returns from equities are dependent on two elements:
(i) Fundamental
(ii) Speculative
The fundamental element concerns the earnings behind the enterprise along with the dividend paid out during the holding period.

The speculative element concerns the changes in the appraisal of the current performance and prospective profitability by the market participants, as a group, having a bearing on PE expansion or contraction, thereby increasing or decreasing the total shareholder return. This speculative element is the product of the general sentiment prevailing and the presence of greed and fear amongst the investors. This is subject to fast changes and this is what makes the markets volatile and unpredictable and also interesting.

The objective is to try and dissect the performance of the Nifty 50 into components, fundamental and speculative. As discussed above the fundamental component reflects the trend in the earnings behind the corporations comprising the Nifty 50 and its impact on investment returns. Speculative component reflects the impact of change in appraisal of earnings, which is change in PE ratios, due to investor optimism or pessimism and how this impacts investor returns.
The objective also is to study whether National Stock Exchange as measured in terms of its broader market index (Nifty 50) is fundamentally driven or speculative driven.
The method of dissecting the performance of the Nifty 50 into its two components, fundamental and speculative is explained below by taking a year's record.

Jan. 1999 to Jan 2000
If one would have bought the Nifty 50 on the first trading day of 1999 at 890.8, one's capital would have grown by 79.69% within a year, as the Nifty 50 closed at 1592.2 on the first trading day of the year 2000. What led to the 79.69% return from the Nifty? Was it the superior performance of the businesses constituting the Nifty? Or was it something else? The following table summarizes the components of the returns:

Table 1: Returns from Nifty 50 Index (1999-2000)

Date	Nifty	PE Ratio	Total Return(1)	Fundamental return(2)		(Speculative Return(3)	Div.Yield
				EPS	Return		
Jan-99	890.8	11.62		76.66			1.83
Jan-00	1592.2	25.91	79.69%	61.45	-19.84%	98.58%	0.95

Source: Calculated and compiled by the researcher based on Secondary data
https://www.nseindia.com/products/content/equities/indices/historical_index_data.htm
(1) Total Return = (Fundamental Return) + (Speculative Return) + (Dividend Yield)
(2) Fundamental Return:
The earning per share, for the Nifty, was Rs.76.66 when it was trading at 890.8 at the beginning of the year 1999. This discounts the earning at 11.62. Fast-forward one year at the beginning of the year 2000, the EPS was Rs. 61.45. Presuming that at the beginning of 2000, the Nifty was discounting the earnings at the same multiple of 11.62; the Nifty would have been trading at 714.05. This would have delivered a return of -19.84%.

Table2: Analysis of Fundamental Return (1999-2000)

	1999	2000
Nifty 50 EPS	76.66	61.45
Nifty 50 PE	11.62	11.62
Est. Nifty	890.8	714.05
Total Return	-19.84%	

Source: Calculated and compiled by the researcher based on Secondary datahttps://www.nseindia.com/products/content/equities/indices/historical_index_data.htm

This -19.84% represents the contribution of fundamental change in the total return for the Nifty 50 during the year 1999-2000.

(3) Speculative Return:

The PE ratios are subject to change as the expectations and sentiments of investors change. In the present example, the PE ratio at the beginning of the year 2000 was not 11.62 but it was 25.91. The impact of this change in PE ratio has on investor return is speculative in nature because this change, in part, is subject to fear and greed of the market participants from time to time and not predictable over a one-year period.

Accordingly, the impact of change in PE ratio on the overall return for the shareholder in 2000 can be calculated using the following formula:

$$\frac{(\text{EPS at the beginning of 2000}) * (\text{change in PE ratio})}{\text{Price Paid}}$$

That is,

$$\frac{(61.45) * (14.29)}{890.8} = 98.58\%$$

Thus, it can be seen that the total return of 79.69% for the Nifty 50 during the year 1999-2000 was a combination of fundamental change to the extent of -19.84%, due decrease in the earnings, plus 0.95% dividend payable during that year and the remaining 98.58% was the result of change in the market's view about stocks in general.

Moreover, in the year 2000 there was a case of positive change in PE ratio, i.e., expansion of PE ratio. On the other hand, if there is a contraction of PE ratio, then the impact on total return for the Nifty 50 will be negative. This is reflected in the 'Speculative Return' column with a positive speculative return indicating 'PE Expansion' and negative speculative return indicating 'PE Contraction'.

Analysis of Performance of Nifty 50(1999-2016)

It will be interesting to study the returns generated by the Nifty 50 for the last 18 years. These historic results are very important as they not only help us draw some important lessons but also will help us in studying the behavior of market participants.

Based on the methodology described above, the returns for the Nifty 50 have been analyzed for the last 18 years from 1999 to 2016 as shown in the Table 3.

Table 3: Returns from Nifty 50 Index (1999-2016)

Date	Nifty	PE Ratio	Total Return(1)	Fundamental return(2)		Speculative Return(3)	Div.Yield
				EPS	Return		
Jan-96	908.01						
Jan-97	939.55						
Jan-98	1081.2						
Jan-99	890.8	11.62		76.66			1.83
Jan-00	1592.2	25.91	79.69%	61.45	-19.84%	98.58%	0.95
Jan-01	1254.3	19.06	-19.97%	65.81	7.09%	-28.31%	1.25
Jan-02	1055.3	15.29	-14.38%	69.02	4.88%	-20.75%	1.49
Jan-03	1100.15	14.92	6.63%	73.74	6.84%	-2.59%	2.38
Jan-04	1912.25	21.09	75.26%	90.67	22.97%	50.85%	1.44
Jan-05	2115	15.57	12.50%	135.84	49.82%	-39.21%	1.89
Jan-06	2835.95	17.16	35.65%	165.27	21.67%	12.42%	1.56
Jan-07	4007.4	21.48	42.51%	186.56	12.89%	28.42%	1.2
Jan-08	6144.35	27.64	54.16%	222.3	19.15%	34.17%	0.84
Jan-09	3033.45	13.3	-48.77%	228.08	2.60%	-53.23%	1.86
Jan-10	5232.2	23.31	73.42%	224.46	-1.59%	74.07%	0.94
Jan-11	6157.6	24.57	18.70%	250.61	11.65%	6.04%	1.01
Jan-12	4636.75	16.79	-23.07%	276.16	10.19%	-34.89%	1.63
Jan-13	5950.85	18.82	29.73%	316.2	14.50%	13.84%	1.39
Jan-14	6301.65	18.69	7.38%	337.17	6.63%	-0.74%	1.49
Jan-15	8284	21.16	32.72%	391.49	16.11%	15.34%	1.27
Jan-16	7963.2	21.53	-2.42%	369.87	-5.52%	1.65%	1.45
Jan-17	8179.5	22.08	4.07%	370.45	0.16%	2.56%	1.35

Source: Calculated and compiled by the researcher based on Secondary data
https://www.nseindia.com/products/content/equities/indices/historical_index_data.htm

The method to study whether the markets are fundamentally driven or speculative driven is as follows:

After dissecting the returns from Nifty 50 into fundamental return and speculative return, student's t-test is conducted to test whether there is a significant difference between the mean total return and mean fundamental return. If the markets are fundamentally driven i.e., good/bad performance of the Nifty stocks has got to do with the consistent/inconsistent performance of the companies behind the stocks then the difference between the total return and fundamental return should be insignificant. In other words if the fundamentals of the companies are the only driving force for the variations in the Nifty 50 then there should not be any significant difference between total returns generated by the index and its fundamental component.
So based on the description given above the hypothesis which is framed and is tested is as follows:

Hypothesis 1
Null Hypothesis: There is no significant difference in the mean total return and the mean fundamental return of Nifty 50.
Alternate Hypothesis: There is a significant difference in the mean total return and the mean fundamental return of Nifty 50.

Table 4: t-Test for Equality of Means of Total Return and Fundamental Return of Nifty 50 (1999-2016)

t-Test: Two-Sample Assuming Equal Variances		
	Total Return	***Fundamental Return***
Mean	0.202116667	0.100110556
Variance	0.130357405	0.020680645
Observations	18	18
Pooled Variance	0.075519025	
Hypothesized Mean Difference	0	
df	34	
t Stat	1.113574451	
P(T<=t) one-tail	0.136636309	
t Critical one-tail	1.690924255	
P(T<=t) two-tail	0.273272618	
t Critical two-tail	2.032244509	

Source: Based on the results generated by using MS-Excel, to the secondary data.
https://www.nseindia.com/products/content/equities/indices/historical_index_data.htm

Calculated value of t is 1.11 for degrees of freedom 34. The significance value is 0.273 which is more than 0.05 (at 5% level of significance), the null hypothesis is accepted. Hence it is concluded that there is no significant difference between the mean total return and the mean fundamental return generated by Nifty 50.
The overall figures suggest that the market as measured in terms of Nifty 50 is fundamentally driven but it can be interpreted in the following ways:
1. There is a difference in total return and fundamental return but it is not significant. In other words though the speculative element is existing but its contribution to the total return is insignificant.

Or

2. The law of averages is nullifying the effect of positive speculative effect with that of negative speculative effect. There are times when speculative element is predominant (either in positive or negative sense) and there are also times when fundamentals of the companies only are ruling the stock markets. The positive speculative effect is being nullified by the negative speculative effect and it is wrongly reflected in the performance of the index that it is only being driven by consistent/inconsistent performance of the companies behind the stocks and it has nothing to do with speculative element of the market participants.

To rule out the later possibility the figures mentioned in the Table.3 are investigated further and an observation was made that in the years 1999, 2003,2006,2007,2009, 2015 and 2016 the positive speculative activity was predominant which was reflected in higher speculative return in Jan. 2000, Jan.2004, Jan 2007, Jan2008, Jan.2010, Jan 2016 and Jan 2017 than the respective fundamental return component in those years. In the years 2000, 2001, 2008 and 2011 the negative speculative activity was predominant which was reflected in higher speculative return (in absolute terms) in Jan 2001, Jan. 2002, Jan2009 and Jan 2012 than the respective fundamental return component in those years. In the years 2002, 2004, 2005, 2010, 2012, 2013 and 2014 fundamental component was predominant over the speculative component which can be seen from the figures of Jan. 2003, Jan2005, Jan.2006, Jan.2011, Jan.2013, Jan.2014 and Jan.2015.
Based on the above demarcation of the years into three groups, **Hypothesis 1** was tested for all these groups and the results are as follows:

Hypothesis 1.1
Null Hypothesis: There is no significant difference in the mean total return and the mean fundamental return of Nifty 50.
Alternate Hypothesis: There is a significant difference in the mean total return and the mean fundamental return of Nifty 50.

Table 5: t-test for Equality of Means of Total Return and Fundamental Return of Nifty 50 (For the years of predominant positive speculative activity)

t-Test: Two-Sample Assuming Equal Variances		
	Total Return	***Fundamental Return***
Mean	0.4667	0.040312857
Variance	0.115354413	0.022889767
Observations	7	7
Pooled Variance	0.06912209	
Hypothesized Mean Difference	0	
df	12	
t Stat	3.03409861	
P(T<=t) one-tail	0.005193585	
t Critical one-tail	1.782287556	
P(T<=t) two-tail	0.010387169	
t Critical two-tail	2.17881283	

Source: Based on the results generated by using MS-Excel, to the secondary data.
https://www.nseindia.com/products/content/equities/indices/historical_index_data.htm

As it can be observed from the Table 5 that the calculated value of t is 3.034 for the degrees of freedom equal to 12 and the significance value which is 0.010387 is less than 0.05(at 5% level of significance) and so the null hypothesis is rejected. Hence the alternate hypothesis is accepted and it is concluded that there is a significant difference between the mean total return and the mean fundamental return.

Hypothesis 1.2

Null Hypothesis: There is no significant difference in the mean total return and the mean fundamental return of Nifty 50.

Alternate Hypothesis: There is a significant difference in the mean total return and the mean fundamental return of Nifty 50.

Table 6: t-test for Equality of Means of Total Return and Fundamental Return of Nifty 50 (For the years of predominant negative speculative activity)

t-Test: Two-Sample Assuming Equal Variances		
	Total Return	***Fundamental Return***
Mean	-0.265475	0.0619
Variance	0.023241469	0.00104714
Observations	4	4
Pooled Variance	0.012144305	
Hypothesized Mean Difference	0	
df	6	
t Stat	-4.201208	
P(T<=t) one-tail	0.002839099	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.005678199	
t Critical two-tail	2.446911851	

Source: Based on the results generated by using MS-Excel, to the secondary data.
https://www.nseindia.com/products/content/equities/indices/historical_index_data.htm

It is evident from the above test results that even in the years where negative speculative activity was predominant the alternate hypothesis is accepted as the calculated t value is -4.2 and significance value is 0.005678 which is less than 0.05 (at 5% level of significance).

Hypothesis 1.3

Null Hypothesis: There is no significant difference in the mean total return and the mean fundamental return of Nifty 50.

Alternate Hypothesis: There is a significant difference in the mean total return and the mean fundamental return of Nifty 50.

Table 7: t-test for Equality of Means of Total Return and Fundamental Return (For the years of predominant fundamentals)

t-Test: Two-Sample Assuming Equal Variances		
	Total Return	***Fundamental Return***
Mean	0.204728571	0.181742857
Variance	0.014929832	0.022262263
Observations	7	7
Pooled Variance	0.018596048	
Hypothesized Mean Difference	0	
df	12	
t Stat	0.315341916	
P(T<=t) one-tail	0.378959274	
t Critical one-tail	1.782287556	
P(T<=t) two-tail	0.757918548	
t Critical two-tail	2.17881283	

Source: Based on the results generated by using MS-Excel, to the secondary data.
https://www.nseindia.com/products/content/equities/indices/historical_index_data.htm

It can be observed from above table that the calculated value of t is 0.315 and the significance value which is 0.7579 is more than 0.05 (at 5% level of significance), so null hypothesis is accepted and this further confirms the point that when the fundamental component is more than the speculative component then there is no significant difference between fundamental component and the total return.

IV. Conclusion

In the words of Meir Statman, "People in standard finance are rational. People in behavioral finance are normal".

The stock market index is a barometer of nation's economic health as market prices reflect expectations about the economy's performance above all it measures the overall market sentiments, the investor's behavior, and their expectations through a set of stocks that are representative of the market. The Nifty 50 Index represents about 62.9% of the free float market capitalization of the stocks listed on NSE as on March 31, 2017. So it is justifiable to study the Nifty 50 in order to draw some meaningful conclusions about the overall market. The indices are termed as leading economic indicators as they are based on future expectations. Discounted cash flow analysis is the appropriate way of valuing a company. However this requires a lot of hard work in understanding the business dynamics and making the relevant assumptions to come to fair valuations. The stock market moves very fast and the lure of making a fast buck before the neighbor does is so great that shortcuts or the rules of the thumb have become the innovations of the valuation game. Investment strategies that exploit emotions have existed for centuries, the newest and most promising area of behavioral finance focuses on identifying mental mistakes regularly made by investors. These strategies do more than just examine the fundamentals of companies or the feelings of investors.

In this research paper a modest attempt has been done to analyze the performance of the Nifty 50 from the year 1999 to the year 2016 and to dissect the performance into fundamental component and the speculative component. Compiling the results of all the four tests it is inferred that though the tests when applied to all the years might suggest that National Stock Market as measured in terms of Nifty 50 is fundamentally driven but there is significant positive speculative activity in seven out of eighteen years and significant negative speculative activity in four out of eighteen years. The effect of both positive and negative speculations though was significant had nullified each other and was not seen in the overall test. Thus it can be concluded with 5% level of significance that the National Stock Exchange as measured in terms of its broader market index (Nifty 50) is speculative driven.

V. Limitations and scope for further study

The present study is limited only to Nifty 50 and does not include other non-indexed stocks. The reasons behind the speculative activity in eleven out of eighteen years can be studied further. The study can also be extended to the other sectorial indices, thematic indices.

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