

Does Exclusion from and Inclusion to Nifty Affect Equity Valuation? A Study with Reference to Metal Sector Stocks

Aadil Hussain Baba¹, Dr. N. V. R. Rajagopalan²

¹Doctoral Research Scholar, Department of Commerce, Annamalai University, Tamil Nadu, India

²Assistant Professor, Department of Commerce, Annamalai University, Tamil Nadu, India

*Corresponding Author

Aadil Hussain Baba

Email: aadilbaba10@gmail.com

Abstract: The study examines the effect on the metal sector stock valuation caused by the exclusion from and inclusion into Nifty 50 index. The study also aims to check the semi-strong form of the market efficiency in the market, by taking a period of 20 years and having taken into consideration 12 events, 06 each from Exclusion and Inclusion. It was found that in case of the excluded companies the stock valuation got reduced in the pre event period but got reversed to its previous position at the end of event window. In case of the Inclusion there has been an increase in the stock valuation during the post event period of the event window. The information got adjusted very smoothly, ruling out the chances of abnormal returns. In both cases the semi strong form of market efficiency was proved.

Keywords: Metal Industry, Exclusion, Inclusion, Market Efficiency, Stock Valuation, Nifty

INTRODUCTION

Metal sector is very important for the development of a country. It is among the most important sectors required for the infrastructure development and plays a pivotal role in our daily routine as metals possess many unique fundamental properties that make them an ideal material for use in a diverse range of applications. India is very rich as to natural source of minerals like gold, copper, chromite, iron ore, manganese, and bauxite. The Indian metal industry is growing up with the innovative techniques as it is helping the product market to enlarge. Indian metal industry experienced big changes in the 1990s with the inception of the Liberalization process. As a result, it is one of the many booming industries in India. New form and sources of investments, infrastructure pertaining to the industry, efficient and technologically advanced methods improved the production processes and in turn the output of the industry increased along with the quality of the products. The demand drivers of the metal sector are enhanced growth in the activities of the automobile industry, real estate sector, transportation system, aircraft industry, ship building industry and the like. Metal sector is playing a lead role in the growth story after liberalisation.

Nifty 50 index being the benchmark and the widely diversified index of National Stock Exchange (NSE) consists of the stocks from all the sectors/industries of the Indian Economy. Metal companies are among the main constituents of the stock indices in Indian stock market. Change in the composition of the index is supposed to have some effect on the stock being excluded from and included in

the index. This paper examines the effect on the valuation of the metal stocks, when the stocks of these companies are excluded from or included to Nifty 50 index.

REVIEW OF LITERATURE

The review of related literature from developed economies and developing economies has been made and presented in nutshell. Prem [1] revealed that stocks included have experienced an excess return of +3 percent and stocks excluded have experienced negative 1 percent excess returns in S&P 500 index. Rajagopalan and Shankar [2] studied the stock returns around buyback announcements; found that market had not given any scope of earning abnormal returns on sustained basis by getting the information adjusted into prices very quickly, to confirm the semi-strong form of efficiency in the Indian Stock Market. Priyadarshini and Louthraj [3] confirmed the theoretical background regarding the impact of dividend announcements and the semi-strong form of market efficiency was proved in FMCG sector. Sekar and Dinesh [5] examined the impact of dividend announcements and confirmed that the Indian Stock Market is semi-strong form of efficient with reference to banking and automobile companies. Selvam *et al* [4] found that the market reacted unfavorably to the stocks included and excluded from NSE S&P CNX Nifty Index. From the literature review it is found that studies were in general and sector specific studies have not been attempted. Hence the present study is undertaken to know the valuation effect of metal sector stocks as a result of exclusion from and inclusion to Market Index.

STATEMENT OF THE PROBLEM

Nifty 50 Index, the benchmark and widely diversified index of the National Stock Exchange (NSE) consist of the highly liquid stocks almost from all the sectors/industries. Changes in the composition in the Nifty 50 index are supposed to have some effects. This paper aims to study the effect on the valuation of metal stocks, when the stocks are excluded from and included in the Nifty 50 Index. The market efficiency aims to check the information content with any event relating to stock in the index and to examine how quickly and smoothly the market absorbs the new information. The paper also studied the Semi-Strong form of market efficiency as the exclusion from and inclusion into the Index is believed to have some information content.

OBJECTIVES OF THE STUDY

1. To study the valuation effect of metal stocks, when they are excluded from and included to Nifty 50 index.
2. To examine the semi-strong form of market efficiency of metal stocks as a result of exclusion and inclusion information.

SCOPE OF STUDY

The study has been undertaken to examine the effect on valuation of the metal stocks caused by the inclusion to and exclusion from the Nifty 50 index. The semi-strong form of market efficiency was also studied with special reference to metal stocks included to and excluded from Nifty 50 index. All the other indices and other sectors pertaining to the Nifty 50 are outside the scope of study.

STUDY PERIOD

The study is undertaken for a period of twenty years, spanning from 1996-97 to 2015-16. The data related to the changes in the composition is available from 18 September 1996. So the whole period has been taken between 1996-97 and 2015-16, to study the effect of composition changes on the valuation of the metal stocks.

METHODOLOGY

Exclusion from and Inclusion into the Index

The study has been undertaken to examine the effect of Index composition changes on the companies' valuation. Change in the composition of Nifty 50 Index means the exclusion from and inclusion in the index. A stock is being included in the index after being scrutinized for the eligibility criteria and excluded after failing to perform under the required standards. Hence the Exclusion and Inclusion were taken up as "Events".

Being the Benchmark, Index Nifty 50 was taken up for the study. All the events from the foundation of the index have been considered for the

study. The dates of events and the share prices of the concerned companies have been collected from Prowess, Capital Line and NSE official website and verified for similarity of price data. The data set for analyzing the returns around the exclusion and inclusion dates were formed by applying the following criteria.

- a) The companies excluded and included should belong to the Nifty 50 index.
- b) Daily closing stock price data over a period of 261 days before the event date and 10 days after the announcement date should be available from the data bases.
- c) The companies selected based on the above criteria should not have event clustering during the event window. In other words, no other event except the exclusion/inclusion should have occurred during the event window of the selected companies.

The selection of the sample companies in metal sector have been done very carefully. During the study period a total of 12 events (06 exclusion and 06 inclusion) have taken place and accordingly those twelve companies are considered for the study.

Event Study Methodology as suggested by Craig A. Mackinlay [6] has been used to analyze the returns around the select event and the following procedure has been followed.

Step 1: The exclusion or inclusion dates of the companies were kept as "event day". 20 days surrounding the event day [10 days before (-10) and 10 days after the event day (+10)] have been taken as "event window". 250 days prior to the first day of the event window i.e. -261 day to -11 days before the event day has been taken as the estimation window.

Step 2: Nifty 50 returns were taken as the proxy of the market, representing widely diversified portfolio.

Step 3: Returns of 250 days during the 'estimation window' of the respective shares' returns (R_j) were regressed against the Nifty 50 returns (R_M) to determine the constant and the regression coefficient in order calculate the expected returns during the event window (Market Model).

Step 4: The Difference between the actual returns and the expected returns (as computed in step 3) during the event window is considered as 'abnormal returns' (ARs).

Step 5: Average Abnormal Returns were calculated across stocks by taking simple average of the

companies considered throughout the event window, on a day basis.

Step 6: Cumulative average abnormal returns (CAARs) were also calculated. The Average Abnormal Returns in all the trading days in the event window and Cumulative Average Abnormal Returns during the event window were analyzed by using ‘t’ test to identify whether they are statistically different from zero to identify the statistically significant abnormal returns.

Calculations

The Return of individual securities are calculated as

$$R_{jt} = (P_{jt} - P_{jt-1})/P_{jt-1}$$

Where, R_{jt} is the returns of security ‘j’ at time ‘t’

P_{jt} is the price of security ‘j’ at time ‘t’

P_{jt-1} is the price of security ‘j’ at previous time observed

In order to calculate the expected return during the event window, based on the constant and regression coefficient during the estimation window (250) days, the following regression is used.

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \epsilon_{jt}$$

Where, R_{jt} is expected return of security j on day ‘t’

α_j is intercept term for security ‘j’

β_j is systematic risk component of security ‘j’

R_{mt} is return on the market portfolio of the Nifty 50 on day ‘t’

(or)

ϵ_{jt} is white noise error term of security ‘j’ on day ‘t’ having zero mean and constant variance

The Abnormal Returns are calculated as,

$$AR_j = R_{jt} - R_{mtj}$$

Where, AR_j is Abnormal Return of the security ‘j’

R_{mtj} is the Return of the security ‘j’ at time ‘t’ arrived at after regressing security return with market returns R_{mt} and

$$R_{mt} = (I_{mt} - I_{mt-1}) / I_{mt-1}$$

Where, I_{mt} is Closing Market Index at time ‘t’

I_{mt-1} is Closing Market Index at previous time observed

The Average Abnormal Returns (AARs) in step 5 for event days observed in the event window across stocks are calculated as,

$$AAR_t = \left(\frac{1}{n}\right) \sum_{j=1}^n AR_t = (AR_{j1} + AR_{j2} + \dots + AR_{jn})/n$$

Where,

AAR_t is Average Abnormal Returns at time ‘t’ for the sample stocks

AR_{j1} is Abnormal Returns observed in security 1 at ‘t’

AR_{j2} is Abnormal Returns observed in security 2 at ‘t’

AR_{jn} is Abnormal Returns observed in security n at ‘t’

Cumulative Average Abnormal Returns (CAARs) are the sums of daily Average Abnormal Returns (AARs) during the event window

$$CAAR_t = \sum_{t=-k}^{+k} (AAR_t)$$

Where, -k to +k denotes -10 to +10 during the event window

While the Average Abnormal Returns (AARs) are used to analyse the information content of changes in composition of index and Cumulative Average Abnormal Returns (CAARs) are used to analyse the adjustments of prices to new information. In order to check the efficiency of market student ‘t test’ has been applied to know whether the Average Abnormal Returns and the Cumulative Average Abnormal Returns did not differ significantly from zero by framing the following null hypotheses.

$$H_{01}: AAR_t = 0$$

The test statistics is

$$t = \sqrt{N} \frac{AAR_t}{S_t} \sim t_{N-1}$$

$$H_{02}: CAAR_t = 0$$

The test statistics is

$$t = \sqrt{N} \frac{CAAR_t}{S_t} \approx N(0,1)$$

ANALYSIS AND DISCUSSION

Stock Valuation around Exclusion date and Price Adjustment

Stock valuation of metal industry, when they are excluded from the index is studied and the effect on their stock valuation and the semi strong form of market efficiency is examined in the proceeding paragraphs.

The AAR and CAAR with the respective values along with statistical significance at 1 per cent, 5 per cent and 10 per cent levels are analysed for exclusion for the study during the event window and is presented in Table 1.

The event day observed a positive AAR of 0.861 % which was not significant, showing that the exclusion has a mild positive effect on the returns but

there was no abnormality recorded. Out of the 21 days considered the significant AAR was observed for only one day, the pre event day, which was negative 1.594 %, at 10 % level. It showed that on the date prior to event day there was a negative impact on the market valuation and also the abnormal returns were statistically significant. The negative impact on the market valuation has been observed more during the

pre-event period than during the post-event period of event window because of the availability of the information regarding the exclusion of companies from the index. Though there has been no abnormal return except on -1st day, the results indicated that the market has not taken the news of exclusion very seriously, but at the same time the exclusion from index had information content to reduce the valuation of stocks.

Table 1: AARs and CAARs of Excluded Stocks

DAYS	AAR	t-statistics	p-value	CAAR	t-statistics	p-value
-10	2.379	1.465	0.203	2.379	1.465	0.203
-9	0.806	0.948	0.387	3.185	1.745	0.141
-8	-0.252	-0.134	0.899	2.933	0.895	0.412
-7	0.269	1.747	0.141	3.202	0.981	0.372
-6	-0.115	-0.118	0.911	3.087	0.934	0.393
-5	0.958	0.535	0.616	4.045	0.896	0.411
-4	-2.791	-1.788	0.134	1.254	0.254	0.809
-3	-1.085	-1.262	0.263	0.169	0.037	0.972
-2	0.118	0.1	0.924	0.286	0.055	0.958
-1	-1.594	-2.554^c	0.051	-1.307	-0.263	0.803
0	0.861	0.994	0.366	-0.447	-0.103	0.922
1	1.290	0.882	0.418	0.843	0.163	0.877
2	-0.651	-0.609	0.569	0.192	0.041	0.969
3	0.339	0.716	0.506	0.531	0.106	0.92
4	0.230	0.401	0.705	0.761	0.149	0.887
5	-0.844	-0.807	0.456	-0.084	-0.017	0.987
6	1.208	1.351	0.234	1.124	0.211	0.841
7	1.130	0.951	0.385	2.254	0.538	0.614
8	0.091	0.083	0.937	2.345	0.511	0.631
9	0.204	0.389	0.714	2.549	0.513	0.63
10	0.343	0.517	0.627	2.892	0.547	0.608

a-Significant at 1% level, b-Significant at 5% level and c-Significant at 10% level

Source: Compiled from Data collected from the www.nse.com

The observation of the CAARs has revealed that there has been no CAAR which is statistically significant. The event day generated a CAAR of negative 0.447 % which was insignificant. Throughout the event window there has been only 3 negative CAARs and the remaining were positive. The negative CAARs found were 1.307 % on -1st day, 0.447 % on event day and negative 0.003 % on +5th day. The insignificance of the CAARs has shown that the change caused by the event was very smooth. The change of CAARs from 2.379% on the -10th day, through CAAR of negative 0.447% on event day, to CAAR of 2.892 %

on the +10th day has proved that the change was temporary and the stocks have recovered to the near actual position. The CAAR from the -4th day in the pre-event period started to reduce and the reduction in the valuation continued upto the -1st day of the pre-event period. The market started to recover which can be attributed to the purchase pressure by the investors for the recently excluded companies. The absence of the statistically significant CAARs supported the semi-strong form of market efficiency. The CAARs of the excluded metals companies are presented graphically in Figure 1.

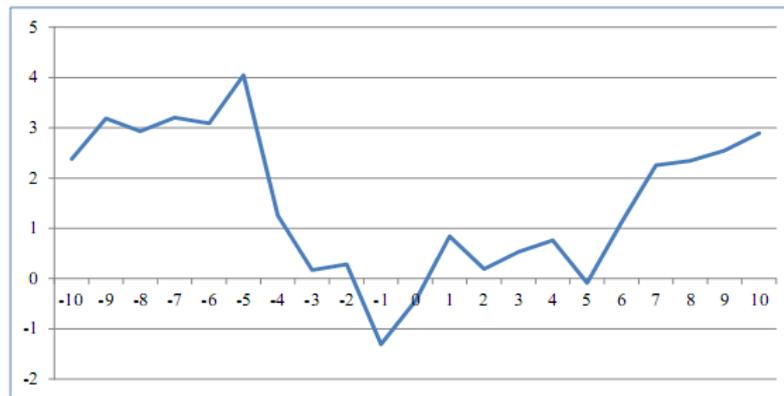


Fig-1: CAARs of the Excluded Metal Sector Stocks

Stock Valuation around Inclusion date and Price Adjustment

Inclusion of stock had a positive effect on the stocks as shown in the reviewed literature. When the stock is included in the Nifty 50 index, impact on the companies’ valuation and the market efficiency is studied in the following paragraphs.

The AAR and CAAR with the respective values along with statistical significance at 1 per cent, 5 per cent and 10 per cent levels are analysed for inclusion for the data for metals companies considered for the study during the event window and is presented in Table 2.

The event day recorded an AAR of 0.304 %, which was not significant, showing that the effect has been positive for the event day, but no abnormal return was found. The market had not taken the inclusion information for any excess valuation of stocks that had been included in index. There has been a mixed reaction of inclusion during the pre-event period. And during the post-event period there has been a dominance of positive effect with positive AARs found in eight days. No AAR was significant during the event window. The results showed that the though there had been positive effects in valuation during the event window, no abnormal valuation was found. It means that the inclusion to index has some information content but no abnormal increase in valuation is observed. Hence the semi-strong form of market efficiency was proved.

Table 2: AARs and CAARs of Included Stocks

DAYS	AAR	t-statistics	p-value	CAAR	t-statistics	p-value
-10	0.454	0.619	0.563	0.454	0.619	0.563
-9	-0.273	-0.585	0.584	0.182	0.355	0.737
-8	-0.995	-1.206	0.282	-0.813	-1.025	0.352
-7	-0.665	-0.928	0.396	-1.478	-1.411	0.217
-6	0.234	0.271	0.797	-1.244	-0.78	0.471
-5	2.658	1.78	0.135	1.414	0.725	0.501
-4	-1.445	-1.522	0.189	-0.031	-0.013	0.99
-3	2.059	1.927	0.112	2.028	0.743	0.491
-2	-0.807	-1.396	0.221	1.221	0.455	0.668
-1	1.224	1.657	0.158	2.445	0.823	0.448
0	0.304	0.218	0.836	2.749	1.009	0.359
1	0.574	0.451	0.671	3.323	1.329	0.241
2	0.117	0.109	0.918	3.440	1.004	0.362
3	-0.680	-0.811	0.454	2.760	0.857	0.43
4	0.076	0.047	0.965	2.836	0.754	0.485
5	2.872	1.005	0.361	5.708	0.929	0.395
6	1.270	0.856	0.431	6.978	0.938	0.391
7	1.784	1.333	0.24	8.762	1.165	0.297
8	2.184	1.066	0.335	10.946	1.193	0.286
9	3.930	0.902	0.409	14.876	1.13	0.31
10	-3.433	-1.321	0.244	11.443	1.07	0.334

a-Significant at 1% level, b-Significant at 5% level and c-Significant at 10% level

Source: Compiled from Data collected from the www.nse.com

An observation of CAARs has revealed that there have been no significant CAARs for the event window. The CAARs were found positive for 17 days and the remaining were negative. Event day observed a CAAR of 2.749 % which was not significant. The negative CAARs were found during the pre-event period of event window and from the -3rd day the CAAR was found positive for all the days of the pre event period of event window. The effect was persistent during the post-event period. The CAAR of 0.454 % on the -10th day, positive 2.749 % on the event day and the 11.443 % on the +10th day reveal the trend of effect

during the event window. The inclusion has been taken positively by the market for metal companies included in the fifty 50 index. The CAAR started to increase from the +5th day in the post event period and the companies valuation increased upto the +10th day of the event window. The absence of the statistical significant CAARs have shown that though there has been an information content, but the information was absorbed smoothly, ruling out the possibility of excessive profit booking, hence confirming the semi-strong form of market efficiency. The CAARs of the included metals stocks are presented graphically in Figure 2.

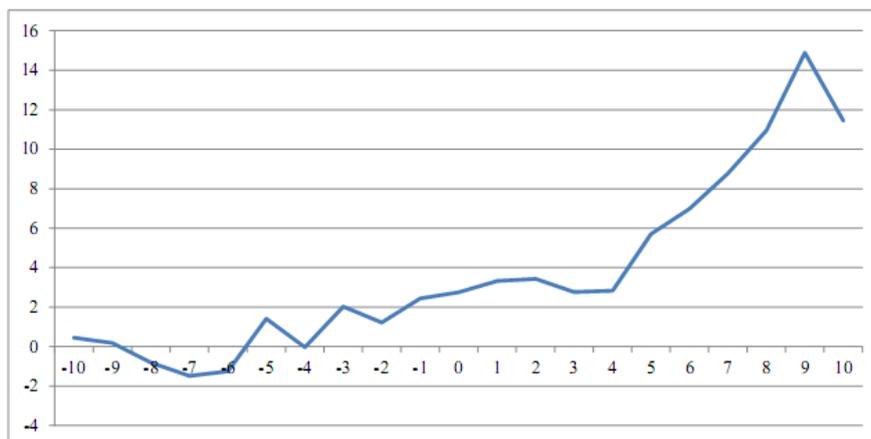


Fig-2: CAARs of the Included Metal Sector Stocks

CONCLUSION

Metal index is a very good guidance for share investing, especially the index funds. The study aims to examine the effect of exclusion from and inclusion to index of the metal stock valuation taking into consideration Nifty 50 index from the inception of the index. For excluded stocks there has been reduction in the valuation in the pre event window which continued upto the pre-event day. The stocks started to recover in the post event window, which can be attributed to the purchase pressure by the investors for the recently excluded companies. The absence of the statistically significant CAARs supported the semi-strong form of market efficiency. For included companies the stock valuation increased in the post event window which was sustained upto the upto a considerable extent at the end of the event window. The absence of a statistically significant CAAR throughout the event window had shown that, though there has been an information content, the information was absorbed smoothly, ruling out the possibility of excessive profit booking, hence confirming the semi-strong form of market efficiency. The results of the study go in line with the theoretical foundation of index funds that exclusion from index reduces valuation and inclusion to index enhances valuation. But this information cannot be used to make abnormal returns, thereby supporting market efficiency in both cases in Metal Sector Stocks.

REFERENCES

1. Jain PC. The effect on stock price of inclusion in or exclusion from the S&P 500. *Financial Analysts Journal*. 1987 Jan 1:58-65.
2. Rajagopalan NV, Shankar H. Buyback Announcements and Undervaluation Signalling in Indian Stock Market: A Study of S&P CNX 500 Index Companies. *International Journal of Exclusive Management Research*. 2012;2(1):121-30.
3. Priyadarshini U, Lourthuraj SA. An Empirical Analysis on the Semi-Strong Form Efficient in Select FMCG Companies Listed in National Stock Exchange. *International Journal of Management*. 2015;6(1):327-331.
4. Selvam M, Indumathi G, Lydia J. Impact on Stock Price by the Inclusion and Exclusion from CNX Nifty Index. *Global Business Review*. 2012;13(1):39-50.
5. Sekar PC, Dinesh S. Determination of Semi-Strong Form of Indian Stock Market with reference to Banking and Automobile Industries. *Indian Journal of Applied Research*. 2013;3(6):261-262.
6. Mackinlay CA. Event Studies in Economics and Finance. *Journal of Economic Literature*. 1997;35(5):13-39.