

Long-term Performance of Stocks Included to and Excluded from Stock Index: Evidence from India

Dhirendra Nath Mahata

Assistant Professor of Commerce, Syamsundar College, Burdwan, West Bengal, India

Abstract: Investment in stocks is one of the most popular investment destinations and different investors follow different strategies while investing and there are lots of strategies depending upon the period of investment, risk taking capacity, amount of fund etc. Many empirical studies around the world show the evidence of abnormal change in the price and trading volume of the stocks included to or excluded from the index when the index composition changes. There are several explanations for these observed effects from the existing literature. Most of the current researches have examined possibility of abnormal profit by following the trading strategies around the announcement date and the date of effective change while the examination of price effect. In this paper I have examined that whether an investor will earn any abnormal profit or not in the long term by investing in included or excluded stocks by using event study methodology and found that investor can use the information of stock inclusion to earn excess return.

Keywords: Investment Strategy, Long-term Return, Stock Exclusion, Stock Inclusion.

1. INTRODUCTION

Investment in stocks is one of the most popular investment destinations for investors because of its expected high profit but selection of stock for investment which will give high return in future not an easy task. All the prospective investors are continuously searching the profitable stocks for investment. Not only the investors but also some highly qualified professionals are doing research to select profitable stocks. Prices of listed stocks always change during trading hour and the changes do not follow any systematic trend but evidence from many researches show that so many factors and events are responsible for stock prices change. Different investors follow different strategies while investing and there are lots of strategies depending upon the period of investment, risk taking capacity, amount of fund etc. Investors do their own analysis on the basis of information published by stock exchanges or broking houses or media, and they find out their own investment strategies. But most acceptable and debatable theory in finance is Efficient Market Hypothesis (EMH) as proposed by Fama in 1965. Fama (1970) defines "efficient market as a market in which prices always fully reflect all available information." According to him prices will change only when new information will come up. As the new information is always unpredictable, therefore, the movement of stock prices cannot be predicted and no one can earn abnormal profit. EMH states that the market price of a security reflects its intrinsic value or fundamental value which is based on the available information and future expectations.

Many empirical studies around the world show the evidence of abnormal change in the price and trading volume of the stocks included to or excluded from the index when the reorganization of index is occurred. In addition to the change in stock price and trading volume there may be some impact on bid-ask spread or on volatility of the event. These changes are observed around the Announcement Date and the Effective Date of the event. But, if the markets are efficient and the information of index composition change available to public there is no reason of believing such type of impact. If stock prices are determined by the company fundamentals only, then stock prices should not change after a company is included to or excluded from a stock market index, provided that inclusion or exclusion is an information-free event.

This article examines the abnormal long term returns of stocks included to or excluded from Nifty 50 during the period from 2002 to 2015 by using event study methodology.

2. THEORETICAL BACKGROUND OF THE STUDY

Existing research finds consistent evidence of price and volume effects associated with the changes of index composition. However the explanations of these effects given by different researchers are not same and we have several explanations for these observed effects from the existing literature. Current literature suggests six important explanations to explain the observed effects of stocks addition to or deletion from index. All the explanations of the effects of stock inclusion and exclusion can be classified into two broad categories. These are – (i) a demand-based explanation; and (ii) an information-based explanation. Some explanations state that the effects are temporary due to index-related trading while the others are in favour of permanent effects. Demand-based explanation includes Imperfect Substitute Hypothesis, Price Pressure Hypothesis, Investor Recognition Hypothesis and Information-based explanation includes Information Hypothesis, Liquidity Hypothesis and The Selection Criteria Hypothesis.

3. LITERATURE REVIEW

Many empirical studies have been done to examine the effect of stocks included to and excluded from stock market index in many countries including India. I have reviewed some of them –

Shleifer (1986) studied on S & P 500 Index (USA) using the data for the period of 1966 to 1983 to find the price and volume effects of stock additions to the index and he found significant positive abnormal return for the included stocks at the announcement of the inclusion and this return does not disappear for at least ten days after the inclusion. The returns are positively related to buying by index funds, consistent with the hypothesis that demand curves for stocks slope down.

Harris & Gurel (1986) investigated price and volume effects of stock additions and deletions to the index using the data of 1973 to 1983 from S & P 500 Index (USA) and they found that increase in price immediately after an addition is announced and this price increase is nearly fully reversed after 2 weeks and there is a large increase of volume on the first trading day after the announcement of addition.

Jain (1987) examined the impact on price of stock additions and deletions to the S & P 500 index (USA) over the period from 1977 to 1983 and concluded that there is a significant price movements associated with the additions and deletions of stocks in the S&P 500 index. The result of the study found that mean excess return for included stocks is positive and mean excess return for excluded stocks is negative on the announcement date.

Lynch & Mendenhall (1997) conducted a study to examine the impact on stock price with the change of index composition in S & P 500 (US) during the period from 1990 to 1995 and they found positive abnormal return of about 3.8% during the period after the announcement and before the effective change, and negative abnormal return after the effective change for stock additions. They also found significant negative permanent price effect for stock deletions from the index. The results of the study indicated that there is a significant positive abnormal volume for six consecutive days starting from the announcement day.

Li et al. (2000) conducted an study on NZSE 10 & NZSE 40 index (New Zealand) over the period from 1994 to 1998 to examine the price effects to the changes of index composition and found that there is no no significant index effect of additions or deletions for NZSE 10 and they conclude that market is efficient for additions in NZSE 40 are concerned and no opportunity for making speculative profit.

Deininger et al. (2000) examined price and volume effects of stocks included and excluded from DAX, MDAX (Germany) for the period from 1988 to 1998 and they found strong abnormal price impact on the announcement date. They also found that included stocks give positive abnormal return and excluded stocks give negative abnormal return on the announcement date though there is significant price increase for excluded stocks during the period from announcement date to replacement date and there is no indication of price reversion. In respect of volume they found abnormal trading volumes are larger and more significant for index inclusion.

Beneish & Whaley (2002) studied the price and volume effects of stocks included to and excluded from S & P 500 (US) during the period from 1996 to 2001 and they found that abnormal returns surrounding the announcement date and abnormal trading volume on the effective day. They concluded that enormous growth of index fund is responsible for such a greater price reaction.

Hanaeda & Sarita (2003) investigated price and volume effects of stocks added to or deleted from Nikkei 225 (Japan) in April 2000 and their findings was newly included firms recorded significant positive excess return in the five day period after announcement of change but excluded and remaining firms' returns negatively affected. They also found significant increase in trading volume for both included and excluded stocks.

Chakrabarti et al. (2005) conducted a study to examine the price and volume effects of included and excluded stocks in MSCI index for the period from 1998 to 2001 and they found that there is a sharp rise in price after the announcement and a further rise before the actual change but part of the gain is lost after the actual change and significant increase in trading volume and it remains high even after the actual change for included stocks and for excluded stocks steady and remarkable price decline. They also found the considerable cross-country variations of these effects in this multi-country study.

Vespro (2006) conducted a study to examine the impact on price and volumes of stocks included to and excluded from CAC 40, SBF 120 (France), FTSE 100 (UK) during the period from 1997 to 2001 and they concluded share price overreact to non-information and price reversal is observed after the effective change and volumes increase permanently for included stocks.

Kumar (2007) examined the price and volume effects of stocks included to or excluded from Nifty & Jr Nifty (India) during the period from 1996 to 2003 and found that stock prices increase (decrease) significantly on the effective day for the Nifty index for additions (deletions) and no such effects were observed for Jr. Nifty index. The prices revert after around a week's time for both cases but no abnormal volumes were detected around the effective day.

Mase (2007) examined long term performance of included and excluded stocks, short term price and volume effects around the announcement and event dates of included and excluded stocks as well as the stocks which are just fail to be included or just avoid being deleted in FTSE 100 (UK) for the period from 1992 to 1999 and they concluded that the analysis of long-run performance yields three-year buy-and-hold abnormal positive or negative returns (measured from 21 days after the event date) for stock additions or deletions. These long-run abnormal returns reflect the impact of increased (reduced) investor interest in additions (deletions), possibly as a result of index tracking and the analysis of short-run returns and volume around the event indicates short term price pressure prior to changes in the constituents of the FTSE 100 Index, both for additions and deletions.

Mazouz & Saadouni (2007) conducted a study to examine the short and long term price effects for stocks included to and excluded from FTSE 100 (UK) over the period from 1984 to 2003 and they found that positive (negative) abnormal returns associated with the added (deleted) stocks in the pre-announcement period and it suggests that information about the index revision are incorporated into the stock price before the announcement date and these returns reverses completely nearly in less than two weeks after the effective change date. They also found the highest (lowest) abnormal return in the sample of the included (excluded) stocks together with the highest volume ratio are found on the day prior to the effective index revision date.

George (2009) conducted a study in S & P CNX Nifty (India) during the period from 2004 to 2006 to examine the price reactions to index reorganization and they conclude that there is no statistically significant price reaction of inclusion and exclusion of stocks in S & P CNX Nifty.

Li. Y. and Sadeghi. M. (2009) investigated the impacts of S&P/CITIC 300 index revisions on the return and liquidity of Chinese equities over the period October 2004–August 2007. They found that stock prices respond positively to index additions, and negatively to index deletions and the study supports the long-term improvement in liquidity for both stock additions and stock deletions.

Hrazdil, K. (2010) found evidence that index inclusion conveys only minimal significant information about future operating performance, which is independent of the decision to include a firm in the S&P 500. The high explanatory power of current performance variables confirms that the S&P focuses on the stability in the index; index firms must be large enough to keep claim of representativeness and importance to economy. The results show limited evidence supporting the Information Hypothesis. The improved operating performance after the index inclusion is independent of the decision to include a firm in the S&P 500, as the future performance is significantly related to its historical publicly available indicators.

Parthasarathy, S. (2010) investigated the price and volume effect of index additions to the Nifty index for period 1999-2010 in the Indian stock market. The study found significant, positive permanent abnormal returns around index announcement and inclusion but the evidence for permanent abnormal volume is limited unlike the developed markets. The results in this study do not support either the downward sloping demand curve hypothesis or the price pressure

hypothesis as the primary explanation for the index inclusion effect but it provides evidence that stock addition to the benchmark Nifty index conveys information regarding the quality of a stock. The result of the study is not consistent with market efficiency as the information of stock inclusion adjusted slowly in the stock price.

Zhou, H. (2011) proposed Investor Recognition Hypothesis to explain the price patterns of included and deleted stocks from S&P 500. He found that the price increases of stocks included in the S&P 500 for the first time is greater and permanent as there is a significant changes in investor recognition and price increases of the upward addition (stocks moved to the S&P 500 from lesser-known S&P indices) and the re-entered stocks in the S&P 500 are weaker and temporary as there is insignificant changes in investor recognition. He also observed that there is no significant difference exists between pure deletions and downward deletions in either magnitude or duration of price effects owing to an insignificant decrease in investor recognition for both subgroups.

Selvam, Indhumathi and Lydia (2012) found that the stocks added to and deleted from Nifty during the period from 1st January, 2005 to 31st December, 2009 experienced negative returns during the pre and post-announcement period and there is only short-term effect on stock prices. It is also found from the study that the investors would not earn excess returns during the announcement day and the effective day for both inclusion and exclusion. The study revealed that the company excluded from Nifty index experienced greater volatility.

Chan et al. (2013) examined the long term performance including changes in institutional ownership, liquidity, analyst coverage, and investor recognition of included and excluded stocks during the period from 1962 to 2003 in S & P 500 (US) and found a significant price increase for added stocks in the short run and in the five-year period after addition and there is an initial price decline for deleted stocks after their deletion from the index and deleted stocks outperform the market in the long run. They also found the increases in institutional ownership and liquidity, a decline in shadow cost, and a long-term increase in analyst coverage for added stocks and decline in analyst coverage, an increase in liquidity, but no significant long-term effects on institutional ownership and shadow cost for deleted stocks.

Rahman & Rajib (2014) found the price and volume effect is less on the announcement date and more on the effective date for inclusions and as well as for exclusions for the period from 1998 to 2011 in S & P CNX Nifty (India). Probable reason of this may be the index fund managers are concentrating less on the announcement date in compared to the actual change day. There is no evidence of permanent price effect, but there were short term price reversals.

Kot et al. (2015) examined the long term performance of stocks additions to and deletions from Hang Seng Index (Hong Kong) over the period from 1986 to 2008 and they found that the stocks newly deleted from the Hang Seng Index have abnormal returns over a 5-year holding period and the newly added stocks show no abnormal returns. The deleted stocks outperform the added stocks, with the difference resulting from poorly performing state owned added stocks and better performing family-owned deleted stocks. Deletion from the Hang Seng Index does not provide new and unfavorable information about a firm and the results are consistent with the finding that family-owned firms outperform non-family owned firms.

Bodhanwala & Bodhanwala (2016) conducted a study on the long term return effects of stocks included to or excluded from CNX Nifty (India) during the period from 2005 to 2015 and found that returns of portfolio of shares excluded and portfolio of shares included are not significantly different. On the effective change date, the stock to be included is overvalued and hence the future returns are poor but after exclusion, the excluded stock is undervalued and hence generates better returns in future.

Ahmed & Bassiouny (2017) studied the price, volume and liquidity effects for stocks included to or excluded from EGX 30 (Egypt) during the period from 2005 to 2015 and found a significant increase in price, volume and liquidity during the period from the announcement to change date of the index constituents for included stocks. Increase in volume for added stocks in the run up window is not reversed in the post change period and deleted stocks indicate an asymmetric effect where an insignificant effect on price and liquidity but a significant effect on volume levels during the post change window.

Papachristou et al. (2018) observed exclusion from the index can be considered as a source of abnormal negative returns and that this exclusion matters more than inclusion to investors and investment strategies on the basis of news of exclusion from the index can lead to the higher performance of investors.

4. RESEARCH GAP

Most of the current researches have examined possibility of abnormal profit by following the trading strategies around the announcement date and the date of effective change while the investigation of price effect i.e. they emphasize on the short-term return. Very few numbers of studies have investigated the opportunity of abnormal profit for investors who follow simple buy and hold strategy. In this paper I have examined that whether an investor will earn any abnormal profit or not in the long term by investing in included or excluded stocks. Again we have a conception that included stocks perform well before the inclusion and the excluded stocks are the worst performers before the exclusion as a result the excluded stocks outperform the included stocks after the effective change date. The validity of this concept has also been examined.

5. HYPOTHESES OF THE STUDY

From the review of existing literature the following hypotheses have been framed and tested in this study:

1. (a) H₀: There is no difference in the return of NIFTY 50 and the return of included stocks during 1 year prior to announcement inclusion.

H₁: Return of included stocks is greater than the return of NIFTY 50 during 1 year prior to announcement of inclusion.

(b) H₀: There is no difference in the return of NIFTY 50 and the return of excluded stocks during 1 year prior to announcement of exclusion.

H₁: Return of excluded stocks is less than the returns of NIFTY 50 during 1 year prior to announcement of exclusion.

2. (a) H₀: There is no difference in the return of NIFTY 50 and the return of included stocks during the period between announcement date and effective date.

H₁: Return of included stocks is greater than the return of NIFTY 50 during the period between announcement date and effective date.

(b) H₀: There is no difference in the return of NIFTY 50 and the return of excluded stocks during the period between announcement date and effective date.

H₁: Return of excluded stocks is less than the returns of NIFTY 50 during the period between announcement date and effective date.

3. (a) H₀: There is no difference in the return of NIFTY 50 and the return of excluded stocks during post inclusion (1 year, 2 years or 3 years).

H₁: Return of included stocks is greater than the return of NIFTY 50 during post inclusion (1 year, 2 years or 3 years).

(b) H₀: There is no difference in the return of NIFTY 50 and the return of excluded stocks during post exclusion (1 year, 2 years or 3 years).

H₁: Return of excluded stocks is less than the return of NIFTY 50 during post exclusion (1 year, 2 years or 3 years).

6. DATA AND METHODOLOGY

Sample Selection: Initial sample consists of all 108 stocks of which 54 stocks are excluded and 54 stocks are included in NIFTY 50 during the study period of 1st January, 2002 to 31st December 2015. Finally the sample size reduced to 84 stocks of which 37 stocks are excluded and 47 stocks are included in NIFTY 50 during the said study period. The main reason for excluding the stocks from the sample is absence of price history.

Sources of Data or Data Sources: The study has been conducted on secondary data and data has been taken from official website of National Stock Exchange (NSE) i.e. from the website 'https://www.nseindia.com' and from the website of 'yahoo finance' i.e. from 'https://in.finance.yahoo.com'. Date of announcement of index composition changes and effective change date have been taken from the website of NSE and all the prices data have been taken from the website of yahoo finance and the prices are adjusted prices after the adjustment of dividends, bonus, and stock splits.

Period of the Study: The total period covers in the study is 14 years i.e. the stocks included to or excluded from Nifty 50 during the period from 1st January, 2002 to 31st December, 2015. The analysis has been done for Pre-Announcement Period i.e. 1 year prior to Announcement, Announcement Date to the Effective Date and during Post-Effective Period (1 year, 2 years and 3 years).

Methodology: This article examines the abnormal long term returns of stocks included to or excluded from Nifty 50 during the period from 2002 to 2015 by using event study methodology and for this purpose I have calculated returns of NIFTY 50 and returns of included and excluded stocks for three main windows – pre-announcement window (1 year prior to announcement to the announcement date), post-announcement window (day after the announcement date to effective change date) and post-effective window. Again post-effective returns are calculated for three different periods viz. 1 year, 2years and 3 years return after the effective change.

Tools used for Analysis / Tests Applied: I have applied F test first to test whether the variances of returns of stocks and variances of returns of NIFTY 50 differ significantly or not and then t Test for two samples having unequal variances has been applied to test the various hypotheses.

7. DISCUSSION OF RESULTS

The returns of different periods for included and excluded stocks are summarized below in Table – 1 and Table – 2:

Table 1: FOR INCLUDED STOCKS

	WINDOW PERIOD									
	AD – 1 Year		AD to CD		CD + 1 Year		CD + 2 Years		CD + 3 Years	
	Stock	Nifty	Stock	Nifty	Stock	Nifty	Stock	Nifty	Stock	Nifty
No. of Sample	35	35	47	47	47	47	47	47	47	47
Average Return (%)	63.14	16.35	5.81	1.17	32.7	19.06	66.59	43.37	118.15	69.09
Maximum Stock Return (%) (Corresponding Nifty Return)	436.62 (74.64)		75.55 (14.43)		205.66 (91.42)		296.45 (101.22)		1096.86 (202.72)	
Minimum Stock Return (%) (Corresponding Nifty Return)	– 81.23 (– 53.49)		– 32.48 (–18.29)		– 76.49 (– 51.99)		– 69.31 (– 3.52)		– 71.36 (18.51)	

From the above table it is seen that average return from the stocks which are going to be included during the period of 1 year prior to announcement is 63.14% whereas the average return of NIFTY 50 during the same period is only 16.35%. So, the stocks which are going to be included in the NIFTY 50 give much higher return than the market index and this higher return is statistically significant at 1% level of significance. Maximum and minimum 1 year stock return before announcement of inclusion is 436.62% and – 81.23% respectively. If we see the average stock return (not annualized) and average NIFTY 50 return (not annualized) in between announcement date and effective change date, these figures are 5.81% and 1.17%. Here also the stocks which are going to be included in the NIFTY 50 give significant higher return than the market index at 10% level. Included stocks outperform the index in post effective period of 1 year, 2 years and 3 years and these are also significantly higher at 10% level of significance.

Table 2: FOR EXCLUDED STOCKS

	WINDOW PERIOD									
	AD – 1 Year		AD to CD		CD + 1 Year		CD + 2 Years		CD + 3 Years	
	Stock	Nifty	Stock	Nifty	Stock	Nifty	Stock	Nifty	Stock	Nifty
No. of Sample	36	36	37	37	37	37	37	37	37	37
Average Return (%)	5.99	25.09	-0.18	1.33	11.1	12.1	35.14	29.66	65.13	47.56
Maximum Stock Return (%)	105.78 (77.72)		39.34 (4.95)		165.48 (69.91)		229.4 (91.13)		437.79 (105.71)	
Minimum Stock Return (%)	– 48.59 (– 11.4)		– 26.09 (– 5)		– 72.12 (– 19.54)		– 86.45 (13.73)		– 83.19 (– 5.91)	
Maximum Nifty Return (%)	83.13 (72.31)		13.82 (6.01)		69.91 (165.48)		101.22 (63.47)		202.72 (120.83)	
Minimum Nifty Return (%)	– 39.58 (– 46.45)		– 18.29 (– 16.84)		– 52.57 (– 59.88)		– 16.64 (– 58.82)		– 5.91 (– 83.19)	

From the Table – 2 it is seen that average return of the stocks which are going to be excluded from the index 1 year prior to announcement is 5.99% whereas the average return of NIFTY 50 during the same period is 25.09%. So, the performance of the stocks which are going to be excluded from the NIFTY 50 is not up to the performance of market index and this difference is significant at 1% level of significance. Average returns of the stocks which are going to be excluded from the index during the period from announcement date and effective change date is also lower than the NIFTY 50 return but this is not significant. If we look at the scenario of post effective returns it is seen that NIFTY 50 return is slightly higher than the return of excluded stocks up to the period of one year but there is no significant difference. If we consider the 2 years or 3 years return from the effective change date then we see that excluded stocks give higher return than NIFTY 50 but no one is significantly higher than the return from market index.

8. CONCLUSION

The result of the study shows that the stocks which are going to include in the NIFTY 50 start to perform well much before the announcement of inclusion and the stocks which are going to exclude from NIFTY 50 do not perform well in comparison to the market index. From the investment point of view it is not possible to earn excess return during this period because it is quite impossible to say which stocks will be included or excluded in the index one year before the actual announcement. For included stocks significant excess returns are found during the period from announcement date (AD) to effective change date (CD) and post effective change period whether it is one year or two year or three years. So, investor can use the information of stock inclusion to earn excess return but they should not invest aggressively and be cautious while investing because during the study period of 2002 to 2015 it is seen that lowest returns of included stocks are – 32.48%, – 76.49%, – 69.31% and – 71.36% during the period from AD to CD, 1 year from CD, 2 years from CD and 3 years from CD respectively. There is no opportunity of excess returns from excluded stocks in India as there is no significant difference of average return of excluded stocks and average return of NIFTY 50.

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