Index Returns and Institutional Trading

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Abstract
It is acknowledged that only 2% of the Indian public invest in stock markets. This compares with 55% in the USA and about 25% in the EU. The Indian public is therefore a miniscule proportion of investors and the power of the Indian public to move markets is negligible.

This means that most trading activity in Indian stock markets are by institutional investors consisting of Foreign Institutional Investors (FIIs) and Domestic Institutional Investors (DIIs). It seems reasonable to hypothesize that their trading activities influence market returns.

This paper aims to verify whether this hypothesis can be sustained by analyzing historical data and calculating statistics such as correlations, regression coefficients and coefficients of determination between FII and DII trading activity and Nifty 500 returns. The key aspects that have been evaluated are buying and selling by these institutional investors. Buy/sell ratios of these institutional investors have also been evaluated since buy/sell ratios are a proxy indicator that indicates the strength of bullishness by these institutional investors.

A similar analysis also been done on Mutual Fund trading activity although mutual fund trading activity is normally subsumed under DII trading activity. Since it can be assumed that Mutual Fund trading arises mostly from the ebb and flow of funds from the investing public, they are an important indicator of general public sentiment.

Some significant unexpected results have been obtained as the result of the analysis. For example, it has been found that Domestic Institutional Investor buying has a negative impact on Nifty 500 return. This is unexpected since it would normally be assumed that an increase in buying by an important constituency such as Domestic Institutional Investor would likely increase Nifty 500 returns on average.

Keywords: Institutional Investors, Nifty 500, Index Returns, Foreign Institutional Investors, Domestic Institutional Investors

Introduction

Individual Investors in Indian Stock Markets

Around 1.5 to 2 crore individuals own stocks in India, while another 1.5 to 2 crore invest in Mutual Funds, ULIPs, NPS, etc. So all in all, the stock Ownership in India is not more than 2.5 to 3% of the total population. This is a very small number if you compare the same with more developed nations. As per some surveys, around 52% Americans own shares and this number was as high as 65% in 2007. In developed markets, majority of stock ownership comes through managed funds or through investment advisers.
Institutional Investors in Indian Stock Markets

The money those domestic institutional investors (DII) have invested in Indian equities touched a record high in the quarter ended June 2019. The value of DII holdings—comprising mutual funds, insurers, banks and other financial institutions—rose to 13.78% by June 30, 2019, up from 13.69% at the end of the previous quarter, data from nseinfobase.com shows. This is 30% lower than the ownership of foreign institutional investors (FIIs), which stood at a two-year high of 19.8% on June 30. In absolute terms also DII holding touched a record Rs. 20.42 trillion, an increase of 0.9% over the previous quarter.

In comparison, FII assets stood at Rs. 29.36 trillion. Historically, FIIs have been the dominant market price-setters, given their size and trading patterns in India. The past three years have indicated a change, with DII flows increasingly becoming the primary driver of market direction.

The widest gap between FII and DII holdings was in the quarter ending March 2015, when DII holding was 50% lower than FII holding.

Over a 10-year period beginning June 30, 2009, FII ownership has increased 6.2 percentage points to 19.8% (from 13.6%). DII ownership has increased only 2.12 percentage points to 13.78% (from 11.66%).

Holding of insurance companies slid 0.53% to Rs. 7.8 trillion as on June 30, 2019. LIC’s holding across 303 companies (for holdings more than 1%) stood at Rs. 6.1 trillion, a decrease of 1.79% over the previous quarter. LIC’s share of investments in equities by insurance companies stood at 78%.

Holding of domestic mutual funds also reached an all-time high of 7.35% at the end of June this year, up from 7.19% in the previous quarter.

Objectives

This means that investment in Indian stock markets is heavily dominated by institutional investors, i.e. by Foreign Institutional Investors (FII), Domestic Institutional Investors (DII) and Mutual Funds (MF).

Therefore, it seems reasonable to hypothesize that Indian stock market returns are mostly caused by the trading activity of these institutional investors. Their trading activity directly influences the ebb and flow of liquidity into the stock markets which causes stock market returns.

This study aims to determine the following:

- Correlation of institutional investor trading activity and index returns
- Extent to which institutional investor trading activity has influenced index returns
- Sensitivity of index returns to institutional investor trading activity

Usefulness

The results of the study may be useful to scientifically minded stock market investors in making investment decisions.

Literature Review

Ankita Bhatia and Naval Kishore (2015) considers data from 2005 to 2015 and uses Vector Auto Regression and Linear regression to examine the relationship between FII investment and BRICS stock markets. It finds that there is positive correlation between FII investment only in the case of Brazil, India, and South Africa. But in the case of China and Russia the correlation is negative.

Yahya Waqas, Shujahat Haider Hashmi and Muhammad Imran Nazir (2015) analyzes the relationship between various macroeconomic variables and FII investment volatility in China, India, Pakistan and Sri Lanka. Data between 2000 and 2012 is employed and GARCH is used for
volatility measurement. It finds significant relationship between these macroeconomic variables and FII investment variability, i.e., less FII investment variability can be expected if there is higher interest rate, currency depreciation, FDI, lower inflation and higher GDP growth.

Hemkant Kulshrestha (2014) considers the period between 1991 and 2012 and uses linear regression to study the relationship between FII net flows into Indian equities and their effect on the BSE Sensex and NSE Nifty. It finds that there is very low positive correlation between them and observes that there are many other factors that influence stock indexes. It finds that IIP, GDP, inflation and interest rates influence FII flows.

Mahesh S. Halale (2014) considers data from Jan-2003 to Sep-2005 and uses correlation to examine the relationship between FII investment and Price Earnings Ratio, Dividend Yield and Book Value of the Nifty index. It finds FIIs strongly influence Nifty returns in the short term only. Indicators like the price earnings ratio, dividend yield and book value of the Nifty show a lagged effect.

Thiripalraju Mand Rajesh Acharya (2013) considers the period between Jan-2000 and Dec-2009 uses Vector Auto Regression and Granger Causality to study the relationship between FII and MF flows and return on the BSE Sensex. The study finds FIIs set trading strategy based on previous investment coupled with index return. Impact of index return on FII investment lasts longer than impact of FII investment on index return. MFs have lost their index influencing ability but FIIs have increased their influence.

Jatinder Loomba (2012) considers the period between Jan-2001 and Dec-2011 and uses correlation to study the relationship between the top 25% absolute and percentage stock index losses and FII flows. It concludes that FIIs flows have a strong relationship to such losses and are therefore an important force driving Indian stock market returns.

Maram Srikanth and Braj Kishore (2012) considers the period between April-2003 and March-2011 and studies FII flows into Indian capital markets and its relationship with key indicators like the BSE Sensex, money supply, IIP, currency rates, foreign currency reserves, WPI and money market interest rates. Granger Causality was used for the analysis. It finds that there is bi-directional causality between FII flows and the BSE Sensex with each reinforcing the other. Also FII inflows resulted in foreign exchange reserve accumulation. Further, higher domestic interest rates and IIP growth encourage FII inflows. There was no cause and effect relationship of FII inflows with the other variables. It also found that FII inflows impacted stock markets positively.

Mamta Jain, Priyanka Laxmi Meena and T. N. Mathur (2012) considers data between 2001 and 2010 and uses correlation to analyze the influence of FII investment and BSE Sensex values. It finds that FIIs influence BSE Sensex movements to a great extent.

Ambuj Gupta (2011) considers the period between 1992 and 2009 and uses linear regression and Granger Causality to study the relationship between FII Purchase-to-Sales Ratio and the Advance-Decline Ratio. It finds that stock indexes cause FIIs purchases and sales with a one day feedback between the stock index and FII purchases and sales. It also finds that FIIs purchases and sales influence the stock index with a two day lag.

Sandhya Ananthanarayanan, Chandrasekhar Krishnamurti and Nilanjan Sen (2009) considers the period between 1993 and 2003 and uses linear regression. It finds unexpected FII flows have more impact than expected flows on the stock index. Its finds that broadening the base of investors to include FIIs reduces market risk premium. It does not find that FIIs use momentum or contrarian methods for investment. It finds that price rise is associated with increased FII inflows. Further, it finds that FIIs do not destabilize stock markets.

Saurabh Ghosh and Snehal Herwadkar (2008) considers data between 1998 and 2008 and uses correlation and Granger Causality to analyze the relationship between FII investment and equity
prices, money markets, benchmark yield and exchange rates. It in the short run a shock in FII flows positively impacts equity markets and negatively impacts money markets, benchmark yield and INR/USD exchange rate. The long run impact for yield, exchange rate and stock indexes is positive while it is negative for money markets.

Krishna Prasanna P (2008) found FIIs invest more in companies with higher public shareholding and that promoter shareholding and FII investment are inversely related. Also share price return and EPS influence FII investment positively. Further, FIIs exit when index performance starts deteriorating.

Sunil Poshakwale and Chandra Thapa (2007) studies influence of FIIs on the short and long term relationships of Indian equities with that of the US and UK. They found that mobility of FII flows have important explanations for short and long term co-movements of Indian, US and UK equity markets. It finds that Indian equity markets are integrating with these markets because of FIIs.

Parthapratim Pal (2005) considers data from 1992 to 2004. It finds that FIIs are major players in the domestic stock market and their influence is growing as increasingly higher turnover is attributable to FIIs. FIIs influence Sensex movement very significantly and this was especially evident after the general election when sudden reversal of FII flows triggered very high volatility.

Dipankor Coondoo and Paramita Mukherjee (2004) examines volatility of FII investment and variables such as BSE and NSE returns, call money rate, FII sale, FII purchase and net FII flow. A new type of analysis has been used that examines three different aspects of volatility, i.e., strength, duration and persistence of volatility. Data used is for the period January 1999 to May 2002. It was found that none of the variables exhibited systematic volatility change over time. Equity return volatilities are proportional to the three FII flows. Money market interest rate variability is the strongest of all the variables in terms of all three FII flows.

Amita Batra (2003) considers the period between Jan-1994 and Dec-2002 and uses Vector Auto Regression. Daily and monthly data has been used to analyze FIIs and their impact on stock market stability. It found that FIIs are positive feedback investors and trend chasers on a daily basis but not on a monthly basis. It also finds FIIs tend to herd. Further, it finds no evidence that FIIs destabilize equity markets.

**Research Methods**

**Sampling Approach**

Secondary data was used for this research since it was sufficient and easily available at no cost. The sample period chosen was April 2008 to September 2019 with monthly frequency thereby obtaining 137 observations.

**Data Collection Procedure**

Data for FIIs, DIIs and MFs were downloaded from the moneycontrol.com website. The following data were downloaded:

- Equity buy value
- Equity sell value

Total institutional equity buy and sell have been calculated as the sum of FII and DII equity buy and sell respectively since DIIs include MFs.

Equity buy/sell ratio for a particular month has been calculated as equity buy divided by equity sell for that month.

Since institutional investors may invest in a wide variety of shares it was considered prudent to use the Nifty 500 index which is a broad market index containing 500 shares listed on the National Stock Exchange (NSE). Closing price data for this index were downloaded from the NSE website.
Statistical Methods
The monthly equity buy/sell ratio was calculated as explained above. It is possible to calculate the monthly rate of change in the buy/sell ratio from this data which quantifies monthly change in institutional investor trading behavior. It is probable that buy/sell ratios are cyclical and have an autocorrelation at some lag. Using periodic rate of change, i.e., first differencing the net cash flow eliminates the problem of autocorrelation.

Likewise, stock markets collect and publish daily index numbers from which it is possible to calculate the monthly rate of change in the index number. Index numbers are cyclical and have an autocorrelation at some lag. Using monthly return of the index number, i.e., first differencing the index number eliminates the problem of autocorrelation.

Using the rate of change data, it is possible to calculate the following:
- Correlation coefficients of institutional investor trading activity and index returns.
- Coefficients of determination of institutional investor trading activity as independent variable and index returns as dependent variable which will quantify the extent to which institutional investor trading activity explains index variance.
- Regression coefficients of institutional investor trading activity as independent variable and index returns as dependent variable which will quantify sensitivity of index returns to institutional investor trading activity.

Results
Please refer table on next page.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Nifty 500 Return</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlation</td>
<td>Regression</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>2 tailed p-value</td>
</tr>
<tr>
<td>FII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy</td>
<td>0.31</td>
<td>0.000</td>
</tr>
<tr>
<td>Sell</td>
<td>-0.03</td>
<td>0.716</td>
</tr>
<tr>
<td>B/S</td>
<td>0.48</td>
<td>0.000</td>
</tr>
<tr>
<td>DII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy</td>
<td>-0.02</td>
<td>0.772</td>
</tr>
<tr>
<td>Sell</td>
<td>0.36</td>
<td>0.000</td>
</tr>
<tr>
<td>B/S</td>
<td>-0.38</td>
<td>0.036</td>
</tr>
<tr>
<td>FII+DII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy</td>
<td>0.24</td>
<td>0.005</td>
</tr>
<tr>
<td>Sell</td>
<td>0.12</td>
<td>0.166</td>
</tr>
<tr>
<td>B/S</td>
<td>0.42</td>
<td>0.000</td>
</tr>
<tr>
<td>MF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy</td>
<td>0.13</td>
<td>0.121</td>
</tr>
<tr>
<td>Sell</td>
<td>0.29</td>
<td>0.000</td>
</tr>
<tr>
<td>B/S</td>
<td>-0.18</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Highlighted p-values are significant at the 5% level
## Discussion

### FII Trading Activity

<table>
<thead>
<tr>
<th>Buying</th>
<th>Selling</th>
<th>Buy/Sell Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Expectedly, significant positive correlation with Nifty 500 return ($r=0.31$)</td>
<td>• Unexpectedly, no significant negative correlation with Nifty 500 return ($r=-0.03$)</td>
<td>• Expectedly, significant positive correlation with Nifty 500 return ($r=0.48$)</td>
</tr>
<tr>
<td>• Explains 10% of Nifty 500 variance</td>
<td>• Does not explain Nifty 500 variance</td>
<td>• Explains 23% of Nifty 500 variance</td>
</tr>
<tr>
<td>• Sensitivity of Nifty 500 return is 0.08</td>
<td>• Sensitivity of Nifty 500 return is 0.20</td>
<td>• Sensitivity of Nifty 500 return is 0.08</td>
</tr>
</tbody>
</table>

FII buying has significant positive impact on Nifty 500 return with a correlation coefficient of 0.31. However, it should be noted that FII bullishness as indicated by the buy/sell ratio has a greater positive correlation at 0.48 with Nifty 500 return than FII buying at 0.31.

Unexpectedly, FII selling does not impact Nifty 500 return.

### DII Trading Activity

<table>
<thead>
<tr>
<th>Buying</th>
<th>Selling</th>
<th>Buy/Sell Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Unexpectedly, no significant positive correlation with Nifty 500 return ($r=-0.02$)</td>
<td>• Unexpectedly, significant positive correlation with Nifty 500 return ($r=0.36$)</td>
<td>• Unexpectedly, significant positive correlation with Nifty 500 return ($r=-0.38$)</td>
</tr>
<tr>
<td>• Does not explain Nifty 500 variance</td>
<td>• Explains 13% of Nifty 500 variance</td>
<td>• Explains 14% of Nifty 500 variance</td>
</tr>
<tr>
<td></td>
<td>• Sensitivity of Nifty 500 return is 0.09</td>
<td>• Sensitivity of Nifty 500 return is -0.10</td>
</tr>
</tbody>
</table>

Unexpectedly, DII buying does not impact Nifty 500 return. This is unexpected because DII buying should theoretically have a positive impact on returns. Even more unexpectedly, DII selling has significant positive impact on Nifty 500 return.

In consonance with these results DII bullishness as indicated by the buy/sell ratio has significant negative impact on Nifty 500 return and seems to be vastly more important than DII buying in its negative impact on Nifty 500 returns.

### FII+DII Trading Activity

<table>
<thead>
<tr>
<th>Buying</th>
<th>Selling</th>
<th>Buy/Sell Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Expectedly, significant positive correlation with Nifty 500 return ($r=0.24$)</td>
<td>• Unexpectedly, no significant negative correlation with Nifty 500 return ($r=0.12$)</td>
<td>• Expectedly, significant positive correlation with Nifty 500 return ($r=0.42$)</td>
</tr>
<tr>
<td>• Explains 6% of Nifty 500 variance</td>
<td>• Does not explain Nifty 500 variance</td>
<td>• Explains 18% of Nifty 500 variance</td>
</tr>
<tr>
<td>• Sensitivity of Nifty 500 return is 0.07</td>
<td>• Sensitivity of Nifty 500 return is 0.48</td>
<td>• Sensitivity of Nifty 500 return is 0.48</td>
</tr>
</tbody>
</table>

FII+DII buying has significant positive impact on Nifty 500 return with a correlation coefficient of 0.24. However, it should be noted that FII+DII bullishness as indicated by the buy/sell ratio has a greater positive correlation at 0.42 with Nifty 500 return than FII+DII buying at 0.31.

Unexpectedly, FII+DII selling does not impact Nifty 500 return.
### MF Trading Activity

<table>
<thead>
<tr>
<th>Buying</th>
<th>Selling</th>
<th>Buy/Sell Ratio</th>
</tr>
</thead>
</table>
| • No significant negative correlation with Nifty 500 return (r=–0.02)  
• Does not explain Nifty 500 variance | • Significant positive correlation with Nifty 500 return (r=0.36)  
• Explains 13% of Nifty 500 variance  
• Sensitivity of Nifty 500 return is 0.09 | • Significant negative correlation with Nifty 500 return (r=–0.38)  
• Explains 14% of Nifty 500 variance  
• Sensitivity of Nifty 500 return is -0.10 |

MF selling has significant positive impact on Nifty 500 return. However, MF buying does not impact Nifty 500 return. MF bullishness has significant negative impact on Nifty 500 return.

These results can probably be explained by the assumptions of contrarian investing strategy. It is likely that most MF investors are uninformed investors who buy when returns are likely to decrease and sell when returns are likely to increase.

### Conclusion

Indian stock markets are not deep enough to absorb the effects of institutional trading since the impact of institutional investor trading activity on Nifty 500 returns are not insignificant. Therefore, investors would be well advised to keep an eye on institutional trading activity while planning their investing strategies in Indian equity markets.

Unexpected results have been obtained for some types of activity by FIIs and DIIs as explained in the previous section. The reasons for these unexpected results cannot be explained by contrarian investing theory since institutional investors are not uninformed investors and contrary market responses to their activities are therefore unexpected.

Approximately expected results according to contrarian investing have been obtained for the activities of MFs.

### References