



OVERCONFIDENCE BIAS IN NIFTY 50 SHARIAH: AN EMPIRICAL ANALYSIS

MD.Qamar Azam¹

¹Research Fellow, Department of Economics, Jamia Millia Islamia (Central University),
New Delhi-110025

ABSTRACT

In this paper, we have empirically analyzed the relation between market turnover and market return to find the presence of overconfidence bias in the Nifty 50 shariah index in the Indian equity market. By taking daily data of endogenous variables like market turnover and market returns and exogenous variables return volatility and exchange rate, we find that market return does not impact market turnover while market turnover impact the return. The return volatility and exchange rate has significant impact on both the endogenous variables. The study is conducted in linear VAR environment for the period 1st - January 2001- 31st December 2019. Our results suggest that investors are risk- averse as they are less prone to overconfidence bias.

KEYWORDS: *Overconfidence Bias, Exchange Rate, Nifty50 shariah, VAR.*

1. INTRODUCTION

The stock market history events like the Black Monday crash (1927), the dot.com bubble, the Asian financial crisis of the 90s, and the global financial crisis (2008), have put a question mark on the history of standard finance theories has shown a larger impact on the stock price changes and trading volumes. These theories were unable to explain the anomalies caused by the various crises and led to the emergence of the new branch of study called behavioral finance to study the irrational behavior of the investors. The proponents of behavioral finance assume that the reason for the various anomalies is the rationality assumption in traditional financial theories.

Since the anomalies which occurred are related to the sentiment of the investors and, it depends on the cognitive and heuristics biases that are most important to study the behavior of the stock market. The behavioral biases are studied but, overconfidence bias is one of the most important biases among them. Overconfidence is defined as the tendency of the investors to trade more and think that they are better than others (Trivers, 1991) but does not mean that they are ignorant. One of the points to be kept in mind while studying trading volume as a measure of overconfidence is the disposition effect. The disposition effect refers to the attitude of an investor towards a specific

portfolio stock (Dhar & Zhu, 2005), While overconfidence affects the whole stock market.

We have taken the shariah-based index¹ Nifty 50 shariah, based on the shariah principles, the legal code of Islam. This index includes only those Nifty 50 companies which are adhering to shariah-compliant. The motive behind testing overconfidence bias in the shariah index is the investors' sentiment, faith, and religiosity of investors that led to cognitive dissonance in many aspects of their life including in banking and finance.

The study analyzes the presence of overconfidence bias in the Indian stock market by taking trading volume as a proxy of for investor overconfidence as most of the previous studies have taken (Statman, Thorley, & Vorkink, 2006) using daily data for the period 1st -January 2011 to 31st-December 2019. This period takes into consideration because of the rising stock prices, the post effect of the global financial crisis (GFC), and structural changes that happened during this period (Economic Survey, 2019-20). The results find that there is a weaker impact of past market returns on current turnover. It is because investors are risk-averse as a result they are less prone to overconfidence bias. To the best of my knowledge, this is the first paper which considers control variable like exchange rate and shariah based index



to test the presence of overconfidence bias in the Indian equity market.

The remaining paper proceeds as follows. Section 2 discusses the Literature review. The data and variables are described in section 3, followed by the methodology in section 4. Results are discussed in section 5 and, section 6 concludes the study.

2. LITERATURE REVIEW

There is plenty of literature on overconfidence bias both on individual and institutional investors based on both theoretical and empirical studies and, it is the empirical analysis of the financial market that is considered as the motive to study the overconfidence bias.

According to empirical studies, if people show a keen interest in trading and investment skills with the help of overestimation then they are more likely to choose their career as a trader or maybe actively be engaged in trade on their own. Thus, these overconfident traders can survive and dominate the markets for a longer period (Gervais & Odean, 2001). Therefore most of the investors suffer from overconfidence bias, an example of cognitive bias. So it is possible to trace the behavior of investors by analyzing the market-level data. Using market-level data from the Taiwan Stock Exchange (Chuang & Lee, 2006) and (Chuang & Susmel, 2011) found a positive relationship between the current trading level and past market returns using VAR analysis. (Statman et al., 2006) using the U.S. stock data to analyze the investor overconfident for both the market-level data and individual security for the period August 1962 to December 2002. The study is conducted using the VAR model.

(Metwally, 2015) in his paper's empirically analyze the presence of overconfidence bias in the Egyptian Stock market for the period from 2002 to 2012 on the aggregate market level data by testing the relationship between market turnover and market return. Further, the period of study is subdivided into four sub-samples: two tranquil periods (2002-2005 and 2005 -08) and two volatile periods (global financial crisis 2008-10 and the Egyptian Revolt 2010-12). The study found a significant impact of past market returns on current turnover while, in the bull market, found to be more than the bearish market.

Similarly,(Griffin, Nardari, & Stulz, 2005) taking the data for the 46 countries, investigate the relation between market turnover and returns at weekly and daily data. The results show that turnover- return relation is found to be more in developing countries, are opaque and more volatile in nature in contrast to the developed ones. Similarly, using daily data for 27 countries and grouping them into advanced, Latin Americans,

Asian and European & Mideast African markets, (Jlassi, Naoui, & Mansour, 2014) for the period January 5, 2000, to December 2012, in their paper, presence of overconfidence behavior and dynamic market volatility: evidence from international data found that overconfidence bias is more pronounced in advance markets in relative to the emerging markets. Further, they have shown that overconfidence bias is the main reason for triggering the global financial crisis in the U.S. markets.

(Gupta, Goyal, Kalakbandi, & Basu, 2018) taking market variables like market turnover, market return, market liquidity, and market volatility investigate the presence of overconfidence bias in pre-, during, and post-global financial crisis for the emerging countries like India and China. The results show that there is a strong positive relation between market turnover and market return in Chinese investors and found to be more overconfident in pre and during the recession period while Indian investors exhibit overconfident in the post-recession period.

3. DATA AND METHODOLOGY

The daily data on market turnover and the market return for Nifty 50 Shariah is from National Stock Exchange (NSE) that offers shariah-based investment solutions to their investors and, Nifty 50 considered as the parent company to Nifty 50 shariah. We obtain data from the Reserve Bank of India (RBI) for the exchange rate. The period of study is from 1st- January 2001 to 31st- December 2019. The value of data is in the domestic denomination.

Variables: Market Turnover (Mkt trn): It is the total turnover of the Nifty 50 shariah. The natural log of turnover is taken as market turnover after detrending the turnover.

Market Return (Mkt rtn): The market return is the log difference between the current price and its previous price of market return index.

$$\text{Mkt rtn} = \ln (P_t/P_{t-1}) * 100$$

Where,

R_t is the market return for period t . P_t is the current period closing value of the index and, P_{t-1} is the previous period closing value of the index.

Market Volatility (Mkt vltv): It is a measurement of risk. The market volatility is the standard deviation of the market return.

Exchange Rate (ER): It is the value of the domestic currency to another country's currency (US \$).

Methodology

Following a plethora of literature, we adopt the vector autoregression (VAR) methodology given by Statman et al (2006). The VAR model is

The following VAR model is applied:

$$Y_t = \alpha + \sum_{k=1}^K A_k Y_{t-k} + \sum B_l X_{t-l} + e_t \quad (1)$$



Where,

Y_t = is an $n \times 1$ vector observation of endogenous variables like market turnover, returns in time interval t .

A_k & B_l = estimate the time-series relationship between endogenous variables and exogenous variables in the system.

e_t = is a residual vector that captures the contemporaneous relation between endogenous variables.

K = is the number of lagged endogenous variables & L is the number of lagged exogenous variables.

4. RESULTS

Descriptive Statistics

Table 1

	MKT_TRN	MKT_RTN	MKT_VLTY	ER
Mean	7.839716	0.025986	0.871359	60.97541
Median	7.851216	0.023449	0.318361	62.76100
Maximum	9.327085	3.113332	37.89540	74.38750
Minimum	4.537427	-6.155924	0.000000	0.000000
Std. Dev.	0.424713	0.933335	1.756920	8.298871
Skewness	-1.441595	-0.329855	8.390577	-1.451786
Kurtosis	12.54648	5.103399	131.4214	9.072723
Jarque-Bera Probability	8370.212	409.0083	1411784.	3813.482
	0.000000	0.000000	0.000000	0.000000
Sum	15836.23	52.49220	1760.145	123170.3
Sum Sq. Dev.	364.1894	1758.781	6232.188	139051.1
Observations	2020	2020	2020	2020

Table 1 represents the descriptive statistics of data. The market turnover is high because the turnover is higher for large companies. Jarque-Bera test and its probability for market turnover, return, volatility, and exchange rate follows the non-normal distribution. The total observation for each variable is 2220.

Unit Root Test

Before working on variables data we test the battery of unit root. For this purpose, we have tested the variable using the Augmented- Dickey-Fuller (1979) test and Philips Perron (1988) test. We have used two specifications: one using constant (C) only and the other using constant and trend (C+T). We found that all the variables are stationary; no trend is found and also shows no co-integration among these variables. Thus, VAR model is applied.

Table 2

Variables/Test	ADF Test		P-P Test		Result
	C	C+T	C	C+T	
Mkt Trn	0.000	0.000	0.000	0.000	Stationary
Mkt Rtn	0.000	0.000	0.000	0.000	Stationary
Mkt Volatility	0.000	0.000	0.000	0.000	Stationary
ER	0.000	0.000	0.000	0.000	Stationary



Lag- Length Criteria

There are no specific criteria for lag selection criteria as previous research indicates. Thus, we allow endogenous variables to identify the lag by

conducting VAR at a different level of lags. The minimum value is obtained at lag 6 and for AIC criteria it is the lowest value.

Table 3.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3310.695	NA	0.137748	3.693424	3.711776	3.700199
1	-3031.566	556.7037	0.101397	3.387045	3.417631	3.398337
2	-2979.614	103.4990	0.096125	3.333646	3.376467	3.349455
3	-2957.075	44.85259	0.094161	3.313001	3.368056	3.333326
4	-2940.940	32.07197	0.092897	3.299488	3.366778	3.324330
5	-2916.956	47.62041	0.090852	3.277234	3.356759*	3.306593
6	-2907.488	18.77923	0.090301*	3.271144*	3.362903	3.305020*
7	-2904.257	6.399083	0.090378	3.272002	3.375995	3.310394
8	-2900.752	6.936519	0.090428	3.272552	3.388781	3.315462
9	-2897.920	5.598542	0.090546	3.273853	3.402316	3.321279
10	-2895.542	4.693997	0.090710	3.275660	3.416357	3.327602
11	-2893.541	3.946029	0.090912	3.277886	3.430818	3.334345
12	-2889.792	7.386228	0.090937	3.278165	3.443331	3.339141
13	-2883.201	12.96906	0.090675	3.275279	3.452681	3.340772
14	-2877.442	11.31921	0.090498	3.273321	3.462956	3.343330
15	-2872.475	9.751598	0.090401	3.272244	3.474114	3.346770

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

VAR Estimation:

Table 4.

	MKT_TRN	MKT_RTN
MKT_TRN(-1)	0.309889 (0.02211) [14.0157]	0.051106 (0.06343) [0.80570]
MKT_TRN(-2)	0.141533 (0.02299) [6.15588]	0.020800 (0.06596) [0.31534]
MKT_TRN(-3)	0.066348 (0.02276) [2.91522]	-0.048415 (0.06529) [-0.74150]
MKT_TRN(-4)	0.061791 (0.02272) [2.71940]	0.020577 (0.06519) [0.31567]
MKT_TRN(-5)	0.114571 (0.02254) [5.08314]	-0.116778 (0.06466) [-1.80595]



MKT_TRN(-6)	0.081244 (0.02172) [3.74024]	-0.042222 (0.06232) [-0.67754]
MKT_RTN(-1)	0.004416 (0.00786) [0.56204]	0.063792 (0.02254) [2.82980]
MKT_RTN(-2)	0.006901 (0.00785) [0.87902]	-0.002733 (0.02252) [-0.12135]
MKT_RTN(-3)	-0.012980 (0.00786) [-1.65225]	-0.060852 (0.02254) [-2.70007]
MKT_RTN(-4)	0.001694 (0.00786) [0.21565]	-0.025839 (0.02254) [-1.14643]
MKT_RTN(-5)	0.008555 (0.00785) [1.08930]	-0.023593 (0.02253) [-1.04713]
MKT_RTN(-6)	0.011884 (0.00784) [1.51645]	-0.037978 (0.02248) [-1.68927]
C	1.436407 (0.18052) [7.95701]	0.872212 (0.51789) [1.68416]
MKT_VLTY	0.037398 (0.00414) [9.02660]	-0.076043 (0.01189) [-6.39774]
ER	0.004766 (0.00091) [5.23333]	0.002035 (0.00261) [0.77875]

Table 4 concludes the VAR results. The turnover is in high correlation with the previous value with the first lagged coefficient is highly significant with the value of 0.309 and at second and at other lags the coefficient value is declining but always remains positive. It means that yesterday turnover has an impact on today's turnover. Further, the investor overconfidence keeps the market turnover at a high level even though turnover does not impact markets return. The impact of market volatility and the exchange rate is found to be significant for both market return and market turnover at a 5% significance level. The

other part of the result indicates that previous return has an impact on today's turnover while the impact is not too strong as we expected and not significant at a 5% significance level. If we compare the coefficient of lagged return to lagged turnover it is found that the lagged turnover coefficient (0.309) is much higher than the lagged return (0.004). Thus, yesterday's return determines today's turnover with lesser impact. This result exhibit the presence of overconfidence bias in the Indian stock market. It also means that Indian investors have imperfect knowledge of the market and, the perfect hypothesis does not hold.

Impulse Response Function

Fig. (a)

Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E.

Response of MKT_TRN to MKT_TRN

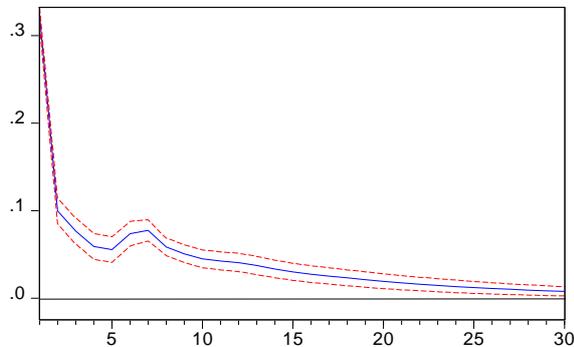
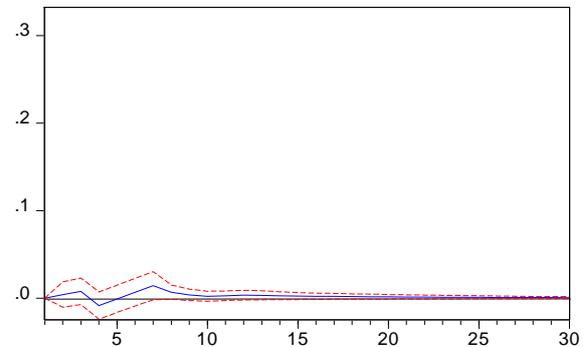
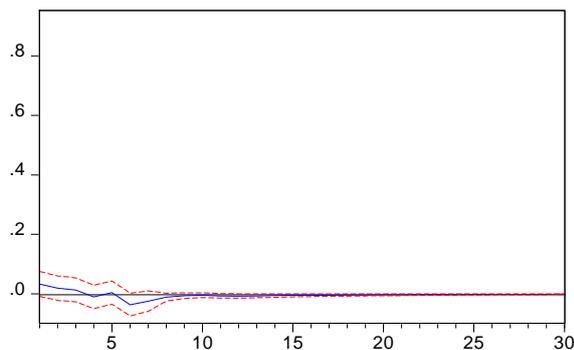


Fig. (b)

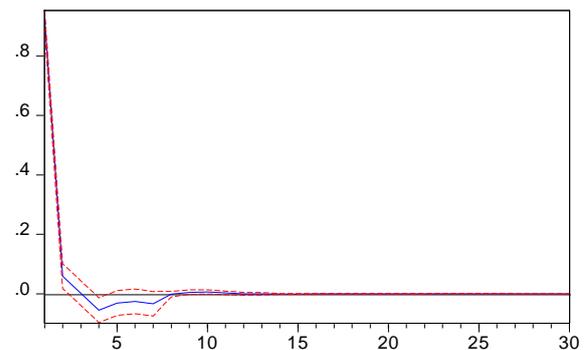
Response of MKT_TRN to MKT_RTN



Response of MKT_RTN to MKT_TRN



Response of MKT_RTN to MKT_RTN



IRF explains the one standard deviation in endogenous variables for the shock of other endogenous variables. It is possible only in VAR analysis. IRF graph predicts the future 30 days behavior for market turnover and market return. The graph in figure (a) shows the impact of one standard deviation of turnover on its self. It remains positive in the first quadrant indicating a positive relationship due to shock in turnover. In figure (b) the shock of return on turnover is represented. It indicates that turnover is impacted by return and for higher lags, it shows a declining trend. The graph in figure (c) indicates that the shock in turnover does not impact return and touches the zero line. Similarly, the graph in figure (d) indicates that returns are positive in the beginning and then decline to a negative quadrant and finally equals to zero.

Further, we have also analyzed and compared the VAR result of Nifty 50 with the Nifty 50 sharia is unreported here. We found that the impact of lagged return on turnover is found to be highly significant. Also, the impulse response function validates the result of VAR with the same period.

5. CONCLUSION

In this paper, we have empirically analyzed the relation between market turnover and market return to find the presence of overconfidence bias in the Nifty 50 shariah index. The results show that investors in the Indian stock market exhibit lesser overconfident behavior because investors are risk-averse as they are less prone to overconfidence bias. Further, the impact of market volatility and the exchange rate is found to be highly significant on turnover and return. The future research can be done by taking other control variables like Gross Domestic Product (GDP), uncertainty, and also by including biases like disposition effect, herding bias with the same set of data.

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ⁱ Shariah Index: It is an index of companies that adhere to the shariah principle. The shariah index, created on the existing index, whose constituents have been screened by the board members. For example, the parent index of Nifty 50 shariah is Nifty 50 and includes those companies which comply with the shariah laws that do not involve in business like pork, alcohol, gambling, and pornography.